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# THE TREATMENT OF TETANUS*

BY

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The treatment of tetanus must be based on an understanding of the cause and a knowledge of the march of symptoms and signs in infections of different degrees of severity.

The tetanus bacillus grows under anaerobic conditions, so that the disease has the greatest chance of developing when bacilli or spores are introduced deeply into the tissues by penetrating wounds. Laceration of tissues with pyogenic infection and the presence of foreign bodies in the wound appear to favour its development. The tetanus bacillus is found in the intestines of various animals, particularly herbivora, where it exists without causing pathogenic effects; it is present in the soil, particularly in highly manured districts. It is prevalent in the intestine of the horse, and no doubt horse ploughing has helped to disseminate the organism. Owing to the resistant nature of its spores the sterilization of catgut has long presented a problem of which occasional disastrous cases of post-operative tetanus are a reminder.

The prophylactic value of tetanus antitoxin was conclusively proved during the war. It is certain that if tetanus antitoxin could be given in every case of infection within twenty-four hours very few cases of the actual disease would occur, and the few which did would be very mild. The almost universal use of prophylactic antitoxin after all deep and infected wounds has altered the type of wound which now causes tetanus in civil practice. Deep suppurating wounds of the classical type no longer give rise to the disease because they lead to the use of prophylactic antitoxin, which is successful in preventing its development. Instead, it occurs after comparatively slight and often superficial wounds which, though infected, have not been properly cleaned or dressed. Often no medical advice is asked for or, if it is, the wound appears too slight to the doctor for antitoxin to be necessary. Mild whitlows in agricultural workers and superficial abrasions in children which have been allowed to scab over without being properly cleaned are two of the commonest types of wound to cause the disease. A scab over a superficial abrasion which has not been properly cleaned will form a cavity full of pus in which anaerobic bacteria will germinate and so cause the disease. The danger of such comparatively slight wounds is not at present sufficiently recognized. If it were, and antitoxin were given in such cases, much tetanus would be prevented.

## Clinical Types of the Disease

It is convenient to divide the disease into five types, although it must be remembered that these types merge into each other:

*Type 1.*—That in which there is local tetanus only.

*Type 2.*—That in which there is generalized tonic rigidity, involving particularly the masseters, the muscles of the spine, chest, and abdomen, and, to a lesser extent, the limbs. This rigidity gradually increases, and then slowly passes off, the whole process lasting from one to four weeks. Reflex spasms and reflex excitability are slight or absent.

*Type 3.*—That in which the tonic rigidity described in Type 2 passes into the stage of reflex spasms, occurring at intervals, and brought on by the slightest stimulation. Such spasms persist for a few days to a fortnight and then cease, leaving the patient again in the state of tonic rigidity, which slowly passes off.

*Type 4.*—That in which the spasms described in Type 3 come on rapidly, becoming progressively more frequent and prolonged until they are almost continuous; death, often preceded by hyperpyrexia of 108° to 110°, takes place from cardiac or respiratory failure.

*Type 5.*—Cephalic tetanus, in which generalized convulsions may occur early with cranial nerve palsies and dysphagia.

## How the Symptoms are Produced

Meyer and Ransom[1] and others have shown how toxin absorbed from a wound spreads to produce symptoms, and that the severity of a case depends on the amount of toxin absorbed. The mechanism is probably as follows:

*Type 1.*—When a very small amount of toxin is slowly absorbed it passes up the axis cylinder of the nearest motor nerve and affects the anterior horn cell or its connexions, local symptoms being originated in the muscles supplied by those cells. In producing this effect on the nerve cell the toxin is absorbed, and none is left to diffuse further into the nervous system.

*Type 2.*—When a slightly larger amount of toxin is absorbed it passes via the lymphatics into the general circulation and so up the motor nerves remote from the wound. The anterior horn cells are affected generally, but there is insufficient toxin to diffuse further into the nervous system. The jaw muscles are first affected because the fifth nerve is short, and the toxin has less far to travel before it reaches the anterior horn cells.

*Type 3.*—With still larger amounts of toxin the anterior horn cells do not absorb it all, but some diffuses into the nervous system, affecting more and more synapses. Each synapse affected absorbs a certain amount of toxin, and so the process is stopped before vital nerve centres are involved. If the patient does not die from exhaustion or respiratory spasm the toxin is gradually neutralized and its effect passes off.

*Type 4.*—The dose of toxin is larger and the process described in Type 3 progresses until such vital centres as the medulla or the heat-regulating mechanism are involved, and death occurs.

*Type 5.*—Cephalic tetanus often follows severe head wounds. Large doses of toxin pass up the relatively short cranial nerves and produce symptoms before the anterior horn cells in the

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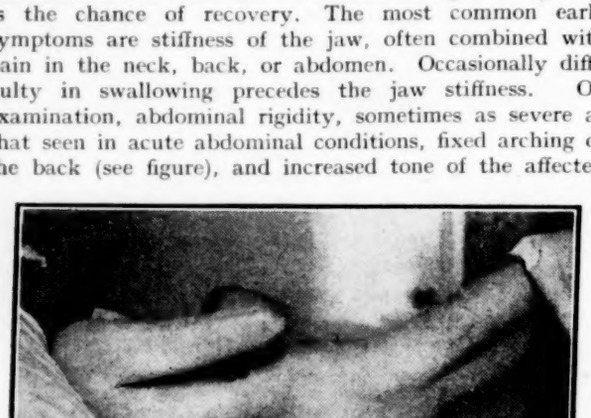
cord have had time to be involved. Severe cranial nerve symptoms therefore occur early and dominate the clinical picture.

### Diagnosis

When the symptoms of tetanus have appeared it is important that a diagnosis should be made as soon as possible, because the earlier treatment is begun the greater is the chance of recovery. The most common early symptoms are stiffness of the jaw, often combined with pain in the neck, back, or abdomen. Occasionally difficulty in swallowing precedes the jaw stiffness. On examination, abdominal rigidity, sometimes as severe as that seen in acute abdominal conditions, fixed arching of the back (see figure), and increased tone of the affected



Tetanus showing arching of the back during the phase of tonic rigidity.

muscles on manipulation are the commonest signs. The facial expression is characteristic during the first twenty-four hours.

I have seen tetanus mistaken for diphtheria and tuberculous and other forms of meningitis; while tuberculous meningitis, peritonsillar abscess, and local conditions of the mouth have been mistaken for tetanus. Early diagnosis should, however, rarely present difficulty if the foregoing points are remembered, particularly the association of stiffness of the jaw and pain in the neck or back made worse by manipulation.

### Prognosis when First Seen

From the point of view of treatment it is important to be able to assess the severity of a case of tetanus as soon as possible. It is well known that this tends to be inversely proportional to the length of the incubation period. This period is of great prognostic value, if it can be measured accurately, but there is always the fallacy that a wound may not have been infected with tetanus when it was incurred but that infection took place later. It is probably for this reason that cases of greater severity occur occasionally than would have been expected from the apparent length of the incubation period.

There is, however, a second measurement which is of greater value in assessing the prognosis, and this is the time from the occurrence of the first symptom to the appearance of the first generalized reflex spasms. For convenience I have termed this the "period of onset." Usually the longer the incubation period the longer the period of onset, but if there is a discrepancy and the period of onset is shorter than would have been expected from the length of the incubation period, then the period of onset gives the best indication of the severity of the disease.

For my own series of twenty-five cases,[2 3 4] the following rule is approximately correct. In an otherwise healthy patient, if the incubation period is more than seven days, the "period of onset" is more than two days, and the combined periods are more than nine days, recovery should occur. On the other hand, if the incubation period is less than seven days, the "period of onset" is less than two days, and the combined periods less than nine days, recovery is unlikely.

Prognosis also depends on other factors, of which the more important are: the general health, physique, and age of the patient; the severity and response of the wound to treatment; the ability to take nourishment; and the severity of the spasms. These considerations are useful in estimating how quickly the reflex spasms are likely to come on, how severe they are likely to be, and how long they will last. They are thus a useful guide to avertin treatment, which will be discussed more fully later.

### Antitoxin Treatment

Treatment should be begun as soon as possible after the first symptoms have appeared, and should be directed along three lines: (1) The prevention of further absorbtion of toxin by the central nervous system; (2) the control of reflex spasms, which kill by exhaustion or by respiratory spasm and suffocation; and (3) the maintenance of strength by giving sufficient food and fluid and promoting sleep. Further absorption of toxin can probably be prevented in two ways: by giving antitoxin and by treating the wound.

Considerable difference of opinion has existed as to the best method of giving antitoxin. Toxin is formed locally in the wound, and reaches the motor cells of the central nervous system in the manner described. It is evident that the first symptoms appear when a certain amount of toxin has reached the nervous system, and that in most cases toxin is still at this stage passing into the nervous system from the wound and general circulation. In most patients symptoms will appear before a fatal dose has reached the nervous system, and the amount already there can be neutralized completely, as shown by cases which recover. If, therefore, further inflow of toxin from the wound and circulation can be prevented soon enough, recovery is simply a matter of time.

Consequently the aim of antitoxin treatment is to bring antitoxin in contact with toxin in large amounts as soon as possible after the first symptoms have appeared. At this stage the toxin still present in the blood and lymph can clearly most speedily be neutralized by a large intravenous dose of antitoxin.

### Intrathecal and Cisternal Routes

By the time the first symptoms have appeared, however, some toxin is passing up the axis cylinders of the motor nerves, some has reached the motor nerve cells, and some is diffusing into the nervous system. It is with the hope of neutralizing this toxin that the intrathecal and cisternal routes have been advocated. Whether this object can be attained at all, and if so better by intrathecal than by intravenous injection, is still disputed. Ransom[1] states that toxin which has reached the nervous system is inaccessible to antitoxin. The problem can be studied from three angles: from a consideration of some points in the anatomy and physiology of the central nervous system, from certain animal experiments, and from clinical results.

Weed[5] has shown that the cerebro-spinal fluid comes mainly from the choroid plexus, a small amount also passing out along the perivascular spaces to the subarachnoid space. From there it travels through the arachnoid villi into the venous sinuses. Fluid introduced into the theca will therefore tend to pass into the veins by the arachnoid villi, and will not come at once into close contact with the nervous tissue.

This suggests that the intrathecal route is inferior to the intravenous. All parts of the brain and spinal cord

are richly supplied with blood vessels and capillaries in close contact with the nerve cells themselves. Antitoxin, therefore, would reach these nerve cells more quickly when given directly into a vein than if it were first injected into the spinal theca and then absorbed into the venous sinuses through the arachnoid villi.

Florey and Fildes[6] compared the two routes in rabbits. In order to be certain that the antitoxin passed out into the nervous tissue and not through the arachnoid villi into the venous sinuses they used a method of reversing the normal direction of flow of the cerebro-spinal fluid suggested by Weed. This consisted in injecting hypertonic saline intravenously so that the fluid from the arachnoid space was sucked in around the pericapillary spaces into the perineural spaces. Using this method they found that the intrathecal route had no advantage over the intravenous.

The opinions of clinicians differ. This is not surprising, because tetanus is such a variable disease that it is very difficult to compare clinically the results of two different routes, and this does not appear to have been done satisfactorily. Many observers have used more than one route in each case, or confined themselves entirely to one route in a series. The comparison of different series of cases means nothing unless a most careful comparison of each individual case is also made.

From theoretical and experimental considerations the intravenous route appears to have most in its favour, for it is clearly the most rapid way of bringing antitoxin into the general circulation, and probably also of bringing it in contact with nerve cells. Intrathecal injection, on the other hand, has several disadvantages. Lumbar puncture must to some degree irritate the nervous system, and to perform it in tetanus a general anaesthetic is necessary. In order to give sufficient antitoxin a large amount of cerebro-spinal fluid must be withdrawn. The injection of serum into the cerebro-spinal fluid is liable to cause a serous meningitis within a few days to some weeks after the injection and, if this occurs when the symptoms of tetanus are still present, it may cause a serious exacerbation. These objections also apply to the cisternal route.

### Repetition of Doses

The next question is whether repeated doses of serum should be given after the large initial dose. The practice of most writers appears to be to give repeated doses of serum daily or at intervals of a few days until the disease has almost subsided. The desirability of giving repeated doses depends on the fate of the antitoxin originally injected. If this disappears rapidly it is clearly more important to give repeated doses than if it continues to circulate. Dean's[7] evidence on this point suggests that injected antitoxin continues to circulate for a considerable period after injection, but no actual figures showing the rate of disappearance appear to be available. The fate of injected antitoxin was therefore investigated by Spooner[3] in four patients, each of whom had been given a single initial dose of 200,000 units. The results of this investigation indicate that seven days after injection there are over 10 units of antitoxin per c.cm.—that is, a total of 50,000 units—still left in the circulating blood, and at the end of fourteen days between 3 and 5 units per c.cm. Since a prophylactic dose of 1,500 units is sufficient to protect in most cases, even from a severe and badly contaminated wound, the possibility of gaining any advantage from a further injection of antitoxin before the tenth day appears to be doubtful.

In my own cases I started by injecting antitoxin by all routes in repeated doses, but in view of Spooner's results I have abandoned this in favour of one large intravenous dose of antitoxin (usually 200,000 units) given as soon as possible. The latter method has been used in the last fifteen cases, and there has been nothing in the results to suggest that anything has been lost by this. This antitoxin is given with the sole idea of preventing further absorption of toxin from the blood and lymph, and not with the hope of neutralizing toxin which is already producing its effect in the nervous system. There is no evidence to suggest that the latter is possible.

### Treatment of the Wound

When the first symptoms appear it is probable that in most cases toxin is still being formed in the wound and being absorbed. It is therefore important that this should be prevented as soon as possible by thorough local treatment. Disturbance of the wound may cause further absorption of toxin, and it should therefore not be touched until the antitoxin has had ample time to reach the tissues to neutralize immediately any further toxin which is absorbed. Exacerbations of the disease have been known to follow operation on a healed wound, and the disease has been known to develop after operation on old war wounds for the removal of a foreign body, probably by stirring up and releasing infection pent up in an old scar. For this reason I am always careful to do nothing to disturb any wound for at least an hour after the intravenous injection has been given.

After this period thorough local treatment is very important. All scabs should be carefully removed, foreign bodies and septic material be evacuated, and the wound be syringed with hydrogen peroxide. In some cases excision of the edges of a wound may be desirable, and penetrating wounds should be opened up. Whitlows should be incised, and if the nail is involved it should be removed. Light porous dressings which do not exclude the air should then be applied four-hourly. Care should be taken that superficial healing does not take place.

### Control of Reflex Spasms

Tetanus patients should be kept as quiet as possible in a darkened room. They should lie on a water bed and the bedclothes should be cradled. All necessary manipuation should be done as quietly as possible and at times when the patient is most deeply under the influence of drugs. In all but mild cases special day and night nurses are essential.

In mild cases in which there is tonic rigidity only without reflex spasms, and trismus is not severe enough to prevent food being given, mild sedatives such as bromide are all that are required. The reflex spasms are the dangerous symptom, and kill by exhaustion or respiratory spasm ; and when, as is usually the case, they are associated with severe trismus, they make feeding difficult or impossible. Directly they appear every effort should be made to control them and keep them controlled. Avertin, the use of which in tetanus was first suggested by Momburg and Rotthaus,[8] is undoubtedly the most valuable drug for preventing the reflex spasms and relaxing the jaw. Given rectally in doses of from 0.07 to 0.1 c.cm. per kilo of body weight, it usually stops reflex spasms and relaxes the jaw for a period of from four to six hours. As soon as the spasms begin to return a further dose should be given, the exact amount being judged by the effect of the previous one and the severity of the spasms. Very severe spasms involving the respiratory muscles and threatening suffocation are an indication for a larger dose. Doses usually have to be given at intervals of six to eight hours, and should be continued according to the severity of the spasms. As these grow less their frequency should be reduced.

The number of doses and the amount of avertin which can be safely given in this way is not at present known. Parsons[9] showed that a dose of 0.475 gram per kilo could produce fatty degeneration of the liver in a rabbit, so that the danger of toxic effect must not be overlooked. I have given 24.4 c.cm. in twenty-three days[4] (eighty-one basal anaesthetic doses) to a baby who started severe tetanus on the seventh day after birth, without any apparent ill effects. Of the total amount, 18 c.cm. were given in nine consecutive days, an average of over seven basal anaesthetic doses per day.

The possible dangers of the treatment have to be weighed against the severity of the disease. In my experience avertin will in most severe cases produce complete control of the reflex spasms, relaxation of the jaw, and lessening of the tonic rigidity about ten minutes after it has been given, and will maintain this relief for from three to eight hours according to the severity of the disease. The only ill effects which appear to be directly due to avertin are on the respirations. These may become more rapid and shallow about ten minutes after it has been given, and slight cyanosis may appear after about half an hour. For this reason it is advisable in some patients to inject atropine hypodermically if such respiratory symptoms appear, and warmed nasal oxygen should always be given when there is cyanosis. Slight rectal irritation occurred in one case as the result of frequent dosage. I have now used avertin in twelve cases, and I have never seen any ill effects which could be attributed to it. On the other hand, it has certainly saved several patients who would otherwise have died.

Paraldehyde is another drug which is valuable for producing sleep and relaxation, but it is not so effective as avertin. It may be given rectally in normal saline (1 drachm to 1½ oz.) in doses up to 6 drachms. I have found the combination of paraldehyde by day and avertin by night useful, but it is probably not as good as, and no safer than, repeated doses of avertin only.

For sudden severe respiratory spasm nitrous oxide and oxygen, or even chloroform or ether, may be necessary until the patient can be put under the influence of a basal anaesthetic. Chloroform or ether, however, should only be used in extreme emergency, their repeated use being very undesirable. Morphine should be used very sparingly on account of its depressing effect on the respiratory centre. It is, however, useful at times.

## Curare for Control of Spasms

The idea of using curare to control the spasms of tetanus is an old one, but its administration is attended with great difficulties, and has never met with convincing success. Hartridge and West[10] have used curare to control the tetany of parathyroidectomized dogs. They found considerable variation in the strength of different samples, and that only two specimens out of seven possessed the power of removing tetany in the dog without causing paralysis. West[11] used one of these samples in the treatment of seventeen cases of muscular rigidity resulting from diseases of the pyramidal and extrapyramidal motor systems, and found that in doses which caused no detectable weakness or loss of power there was considerable reduction of rigidity while under the influence of the drug. The variation of strength and mode of action of different samples makes dosage a very difficult problem until some accurate method of standardization is discovered.

Florey, Harding, and Fildes[12] have used curarine to control the spasms in rabbits inoculated with tetanus toxin. They found that by injections at intervals of half an hour they were able to maintain paralysis, and so control the spasms and rigidity. They suggested that curarine might be used to control the spasms of human tetanus, provided that a Drinker artificial respirator was used to obviate the danger of a slight overdose causing respiratory paralysis. West[13] has recently treated three cases of very severe tetanus with curarine given by the continuous intravenous drip method. He suggests that this is the best method at present available, but emphasizes that the treatment is experimental, and should only be used for patients who will certainly die if treated by other methods. I have treated three cases with subcutaneous curare, and in one of these curare may have been the deciding factor which led to recovery.

The second case was interesting. It was the most severe case of tetanus I have ever seen. The spasms, which had been continuous, and of the most intense severity, were almost completely controlled by curare for the eight hours before death. In spite of this the general condition of the patient did not improve, and hyperpyrexia of 108° F. occurred shortly before the end. This seemed to show clearly that if sufficient toxin has been absorbed to penetrate deeply into the nervous system and reach certain centres in the brain it will kill quite regardless of whether the spasms are controlled or not. Until some method is found of neutralizing toxin in the nervous system such patients will inevitably die. In most cases, however, a sublethal dose only has been absorbed by the time the early symptoms appear, and if the further absorption of toxin is stopped by antitoxin and by treating the wound, and general exhaustion is prevented by controlling the spasms, recovery may follow.

Since using curare I have had considerable further experience with avertin. Avertin can do all that was hoped of curare or its derivatives with very much less risk to the patient, and I feel, therefore, that at present curare and curarine should not be used until more is known of their action.

## Maintenance of Patient's Strength

An attack of tetanus means prolonged exertion without rest or relaxation, associated with toxaemia, severe pain, and often a high temperature. To pass successfully through such an ordeal a great deal of food is clearly of vital importance. Some idea of the amount of work which a patient with tetanus has to perform may be obtained by lying for a few minutes with the shoulders on one chair and the buttocks on another, keeping the back slightly arched. Further, a patient with a period of onset of twenty-four hours will, if he survives, probably have reflex spasms over a period of three weeks, with a period of onset of forty-eight hours reflex spasms for from one to two weeks, and with a period of onset of four days reflex spasms for one week.

In an adult patient an attempt should be made to give at least 2,000 calories daily. Every tetanus patient should have a special nurse, her main duty being to see that as much food as possible is given. Glucose lemonade and egg and milk are satisfactory foods; these should be given hourly or more often if the patient is taking well. Usually tetanus patients are very thirsty, and will take fluids well. If sweating is profuse, normal saline solution should be given by the mouth or rectally to make up for the loss of chlorides. If trismus is severe removal of teeth may be necessary. Avertin is valuable in relaxing the jaw, and so making feeding easier. Under avertin it is sometimes possible to pass a stomach tube, which is left *in situ* so that the patient can be fed. When the muscles of deglutition are early affected feeding becomes almost impossible by any other means, and the outlook is correspondingly bad. The value of the stomach tube when tetanus occurs in infants was well shown in the case of the baby who was kept under the

influence of avertin for twenty-three days. Here the tube was passed by the nasal route and left *in situ*, being removed once daily to be cleaned. By this means the average daily intake of food for the whole twenty-three days was 260 calories, the theoretical caloric requirement being 300 daily.

Rectal feeding is useful in some cases, and patients seem to retain fluids well, but it is quite impossible in a severe case to give sufficient nourishment by this means alone, and intravenous infusions are necessary. The importance of giving sufficient food can hardly be overemphasized, and success depends largely on nursing efficiency.

### Summary

The treatment of tetanus may be summarized as follows:

1. As soon as possible after the diagnosis is made give 200,000 units of antitoxin (int.) intravenously.

2. One hour after the antitoxin has been given treat the wound. After appropriate surgical treatment irrigate with hydrogen peroxide.

3. Keep the patient as quiet as possible in a darkened room. If reflex spasms have not begun give large doses of bromide and as full fluid or semi-fluid diet as possible.

4. If the period of onset is four days or longer, and the reflex spasms are not severe, treatment with avertin need not be started at once, but it should be begun if the spasms become severe or if the patient shows signs of exhaustion. In such a case one basal anaesthetic dose daily may be sufficient.

5. If the period of onset is three days or less treatment with avertin should be begun at once and continued according to the severity and duration of the spasms. With prolonged spasms causing respiratory embarrassment the dosage should be larger and more frequent.

6. When avertin treatment has begun nasal oxygen should be given as required, and atropine hypodermically if there is respiratory difficulty.

7. Arrange that any necessary manipulations such as the giving of enemas, rectal salines, hypodermic injections, or local treatment of the wound are undertaken when the patient is most deeply under the influence of avertin.

8. Continue the avertin treatment as required, and reduce the dose gradually as the spasms become less.

9. If hyperpyrexia occurs treat by tepid sponging.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The Ministry of Health has published a list of approved treatment centres under the Public Health (Venereal Diseases) Regulations, 1916, with particulars as to the days and hours for medical examination and treatment, and for intermediate treatment by or under the supervision of nurses or male attendants. A list of the hostels and other institutions for women which accept in-patients under the approved schemes of local authorities for the treatment of venereal diseases is appended. This list, designated "7, May, 1936," supersedes its predecessor, which was issued in March, 1934.

# CAVERNOUS SINUS THROMBOSIS

## A STUDY OF THE CASES OF RECOVERY


BY

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Thrombophlebitis of the cavernous sinus is generally considered a rare but fatal condition ; a study of the literature published on this subject reveals but a small number of cases of recovery. It is the object of this paper to review these cases to date, not only those recorded by Eagleton in 1926 but also those which have been published subsequently, to add one case from my own experience, and to ascertain what may be learnt from this material with regard to the prognosis and treatment of this grave condition.

### Historical Review

The first mention of cavernous sinus thrombosis was made in 1818 by Abercrombie, who described the condition from a post-mortem finding. Vigla, in 1839, was probably the first to make a clinical diagnosis, but it was not until 1902 that attempts were made to attack this sinus surgically, by Dwight and Germain. With regard to the first recorded case of recovery there exists some doubt as to the correct diagnosis in several of the earlier publications, but probably that of Bircher in 1893 is the most authentic, and in this case the thrombosis was probably aseptic.

### Anatomical Considerations

Though from the standpoint of operative surgery the cavernous sinus is one of the more inaccessible parts of the body, from the anatomical and pathological aspect it is open to attack from many directions, and to that extent is remarkably vulnerable to any pyogenic infection of the head and neck which has overcome the bounds of tissue resistance and invaded the blood stream. Without entering into any detail of the anatomy, it may be useful to recall that the main connecting channels of the cavernous sinus anteriorly are the ophthalmic veins, communicating with the angular veins and the venous system draining the region of the face, the pterygoid plexus, connecting with the venous drainage of the buccal and pharyngeal region below, and the petrosal sinus, communicating with the jugular bulb and the internal jugular, below and behind. The fact that the veins in this region possess few valves permits not only the rapid invasion of the sinus, which may occur through afferent channels such as the ophthalmic veins, but also a slower retrograde thrombosis and spread of infection along efferent tracts such as the internal pterygoid plexus and petrosal sinuses. Herein lies, to a great extent, the explanation of the two main clinical types of thrombophlebitis of the cavernous sinus. First, the acute fulminating invasion, usually associated with septic lesions of the face, presenting at an early date the well-known classical signs of swelling of the eyelids, chemosis, and proptosis, accompanied by the symptoms of fever, with rigors, due to the general blood stream infection. The rapid onset of meningitis and a fatal termination is, almost invariably, the result in such cases, and the diagnosis is seldom, if ever, in question.

In the second type, however, the invasion is more gradual and insidious. The septic or protective thrombosis advances in a retrograde manner against the blood stream, in the pterygoid plexus or petrosal sinus, and enters the cavernous sinus in its postero-inferior region. As may be expected, this type of case is associated generally with septic lesions of the middle ear and mastoid,

tonsillar region, or neck, and in contrast with the former may present none of the classical signs, rendering the diagnosis often a matter of difficulty, and tending to cause a delay in surgical intervention until perhaps it is of no avail. A study of the records shows that by far the majority of cases of recovery fall within this second category.

## Cases of Recovery

Eagleton[1] in 1926 made a great contribution to the study of this subject, both by a review of all cases reported up to that date and from his personal observations of a considerable amount of clinical material, all carefully checked by findings at operation and at post-mortem examination. By this means not only has the course of infection been proved in those cases which have been suspected or definitely diagnosed, but also it has been shown that thrombosis of the cavernous sinus exists more frequently than is thought as a terminal complication in many fatal cases of meningitis in which the classical signs have not had time to develop. The practical value of the study of any such records rests in the help it may afford in the future diagnosis and treatment of the condition in question.

This end may be best achieved by making an analysis of the cases, for which purpose it seems best to adopt some form of classification of the cases according to their type and mode of onset—for example, (*a*) the acute fulminating and (*b*) the chronic compensatory—and of the treatment according as to whether it comprises: (1) major surgery, directed at the cavernous sinus itself; (2) accessory surgical measures, dealing with the primary source of infection and the draining of formed abscesses; (3) serotherapy, blood transfusions, etc., in treating the general blood stream infection; or (4) spontaneous recovery in the absence of any form of treatment. In applying this classification first to the recorded cases of recovery collected by Eagleton up to 1926, and the two from his own experience, we find that only one case of the acute infective type had recovered as the result of operation upon the cavernous sinus itself, and this was one of Eagleton's own cases. In addition to the direct attack upon the infected sinus the common carotid artery had been ligatured, a technical detail upon which the author lays great stress. Bircher in 1893 was the only other surgeon who could show a case of recovery from operation upon the sinus itself, but his case was of the chronic compensatory type following a mastoid infection.

Of the remaining number of recoveries, varying from twenty to forty (this large discrepancy is due to the overlapping of some publications and to the doubtful nature of some of the others), all have recovered as a result of operation draining the primary source of infection and the channel of approach, or, in some cases, spontaneously. They have conformed generally to the chronic compensatory type, and roughly half the number were of aural origin. One case, reported by Chisholm and Watkins, was dealt with by the administration of stock and autogenous vaccines only.

## Cases Treated by Operation

Twelve cases have been published since Eagleton's work in 1926, in addition to the one reported in this paper. Of these, in three alone was operation undertaken on the cavernous sinus itself.

### CASE I

Browder[10] in 1933 reported the case of a male aged 23, admitted with a carbuncle on the right side of the nose and much swelling of the right upper lid following the application of *x* rays. Examination of the right fundus showed early oedema of the optic nerve and engorgement of retinal veins, but no haemorrhages. *Staphylococcus aureus* was cultured from the carbuncle and from the blood. It was thought that thrombophlebitis was spreading backwards to the cavernous sinus. This region was therefore exposed and electro-coagulation of the sinus carried out, up to the orbital fissure. The cranial wound was then closed without drainage. The operation was followed for several days by marked swelling of the right eye and proptosis, and orbital abscesses were drained for some months. The patient eventually recovered, with blindness of the right eye. At no time was the left eye involved.

### CASE II

Christophe[2] in 1928 reported the case of a woman aged 32, who, after three months of gradually increasing pain from a filled right upper premolar, began to run a high temperature and rapidly lost the vision of the right eye. This was followed by exophthalmos, extreme chemosis, and limitation of movement; examination of the fundus was impossible owing to extravasated blood. At operation the following day the common carotid was first exposed and clamped, under local anaesthesia, and then under a general anaesthetic the orbit was exposed by turning out an osteoplastic flap; it was not found necessary to remove the eye in order to expose the wall of the cavernous sinus, which was then incised; some dark disorganized blood exuded. The clot, however, was not disturbed, but a drain was inserted and the wound otherwise closed. There was no shock following this operation, the temperature came down at once, and the general condition improved. The arterial clamp was replaced by a silk ligature on the sixth day. A temporary blockage of the orbital drainage precipitated an erysipelas, which drew attention to the question of the infecting organism. A radiograph disclosed an abscess of the root-filled premolar, which was promptly extracted. The patient then made a complete recovery. The author's experience in this case makes him put in a plea for the attempt to conserve the eye in this operation in future.

### CASE III

Lauwers[11] in 1934 reported the case of a boy of 13 admitted with a history of ulceration of the right tonsil a fortnight previously, severe pains in the right side of the face (for which several teeth had been extracted), followed by rigors, swelling of the eyelids, and proptosis. A diagnosis of a right cavernous sinus thrombophlebitis was made and the patient operated on the following day. Under local anaesthesia the common carotid was ligatured, then under a general anaesthetic the external inferior ophthalmic vein was opened and drained of broken-down blood clot, through a catheter; the wound was then closed. The patient's condition steadily improved, the drainage tube was removed on the ninth day, and one month from the date of admission the patient was discharged.

## Anti-infective Therapy

Under the heading of blood stream therapy come four cases, in three of which infection was caused by a staphylococcal lesion of the skin, which must be considered as acute infective rather than chronic compensatory cases.

### CASE IV

Stout[6] in 1931 published two cases of septic cavernous sinus thrombosis, one of which recovered under intensive treatment with bacteriophage. A female, aged 16, had a small furuncle on the chin, which was treated by incision and hot fomentations. The swelling increased and the temperature rose to 103° F. Local and hypodermic administrations of bacteriophage and deep thermo-cautery were applied, and 50 c.cm. of antistreptococcus serum was given. Blood culture showed the presence of *Staphylococcus aureus*. On the ninth day the right eye showed chemosis and proptosis, and four days later the left eye became similarly involved. Daily intravenous injections of bacteriophage were resorted to, and continued until urticaria, with painful joints, developed. The swelling of the eyes and face began to improve, and allowed an examination of the pupils, the right one being somewhat dilated; the retinal veins were congested, but the nerve and macula were normal. The

blood picture, which was closely watched, showed an increase in the leucocyte count. The gradual improvement was interrupted about the thirty-second day of illness with severe pains in the head and neck and vomiting. A spinal puncture showed turbid fluid under high pressure, with a high cell count, and staphylococci on culture. A trial intrathecal injection of 1 c.cm. of bacteriophage was made. This was well tolerated, and a daily injection of 4 c.cm. was given for four days. The patient's general condition improved, and she was discharged from hospital on the seventy-eighth day of illness with normal vision.

#### CASE V

Lewis[5] in 1931 published the case of a boy of 15 who came under his care with a five-days history of a boil on the left cheek which had been incised on two occasions. Bacteriophage was given intravenously. There was a rapid onset of eye symptoms, extreme chemosis and proptosis, etc., with involvement of the cranial nerves and signs of meningitis. The temperature was 101°–104° F. This hopeless condition persisted for several weeks, when a gradual improvement set in, and in the course of three months, with the exception of total blindness of the left eye, the patient was restored to normal health.

#### CASE VI

Weizenhoffer[8] in 1932 described the case of a woman aged 29 with a furuncle of the right auditory meatus. In spite of incision, infiltration in the neighbouring tissues increased and the temperature rose to 104° F. A pulmonary infarct then developed suddenly. Eight days from the onset of symptoms pain began in the left eye, with swelling of the lids and some proptosis, marked engorgement of the ciliary and fundus veins, and swelling of the disk. The right eye showed mild choking of the disk. The blood culture was positive for *Staphylococcus aureus*. Two days later the right eye began to swell, chemosis was marked, and the left external rectus was paralysed. The temperature rose to 105.4° F. with delirium and incontinence. Four days later 300 c.cm. of citrated blood was given intravenously. Then the swelling of the eyelids began to subside, the retinae became normal, and vision was unimpaired. During the following month transfusions were given on six further occasions. All signs and symptoms gradually cleared up, and the patient was discharged from hospital.

The author points out some features of this case: the unusual location and trivial nature of the original focus, the involvement of the cavernous sinus of the opposite side first, the absence of visual impairment, the long period, five days, between blood stream infection and the onset of eye symptoms, and finally the positive blood culture.

#### CASE VII

Gerrie[12] in 1935 reported the case of a youth of 18 who had had a submucous resection of the nasal septum. During the following week he began to have rises of temperature up to 102° F., accompanied by headache and pain on moving the eyes. These symptoms increased in severity, showing definite signs of meningeal irritation by the twelfth day, when, incidentally, a septal abscess was discovered and drained. The following day the classical signs of cavernous sinus thrombosis became apparent. Treatment by blood stream therapy was considered preferable to operation, and 20 c.cm. of polyvalent antistreptococcal serum was administered intramuscularly, to be repeated intravenously the following day and again five days later. The patient made an uninterrupted recovery.

### Spontaneous Recovery

There is one case which appears to have made a spontaneous recovery without treatment of any kind, and which certainly belongs to the chronic compensatory type.

#### CASE VIII

Seale[3] in 1929 reported the case of a native African woman aged 30, with a history of pain and swelling in the left eye following a severe confinement; there was definite proptosis. This lasted some months, and was followed by a similar train of symptoms in the right eye. This on admission was markedly proptosed, and there was swelling of lids and chemosis. Ciliary vessels showed no fullness; the pupil was semidilated and insensitive to light. The eyeball was fixed, disk somewhat pale, field of vision diminished—R.V. 6/36; L.V., can count fingers at six feet. The swelling of the eyelids and chemosis gradually settled down. When seen four months later the cornea was hazy, visual field much reduced, and she could count fingers at two feet only. Four years later the right eye was shrunk into the orbit and was quite blind. The left eye was normal.

### Chronic Cases

The remaining cases represent the type in which invasion is slow in onset, and in which any operation has been incidental—dealing with the primary focus and route of invasion or formed abscess, but not with the cavernous sinus itself.

#### CASE IX

Logan Turner and Reynolds[13] in 1931 published their conclusions based on the exhaustive examination of fifty-five cases of intracranial pyogenic infection. Of these, twenty-two deal with thrombosis of the cavernous sinus, either by blood stream infection or by direct extension through bone (for example, sphenoidal sinus infection) and of this number one ended in recovery.

This case, previously published by Dr. J. S. Fraser and J. K. Milne Dickie, was that of a male aged 61, admitted to the Royal Infirmary, Edinburgh, with a nine-weeks history of acute suppuration of the middle ear. The following day a Schwartze operation disclosed a generally infected process, which was drained. For a week the temperature would not settle, and the swelling below the mastoid process necessitated further operation. Pus was found beneath the sternomastoid sheath. The lateral sinus was normal. The day after this operation the right eye became painful and the conjunctiva swollen. Two days later there was marked chemosis, and vision was practically lost. Examination of the fundus showed thrombosis of the retinal veins. Oedema of eyelids and proptosis and fixation of the eyeball followed. During this period the temperature was normal and the patient's general condition good. Pus continued to drain from the wound in the neck, and during the following week the swelling, chemosis, and exophthalmos began to subside, but the ulcerated condition of the cornea necessitated enucleation of the eyeball, and an uninterrupted progress led to his discharge from hospital.

#### CASE X

Agnello[4] in 1929 reported the case of a boy aged 5, admitted with a history of onset of pain in the left side of the face eight days previously, followed almost immediately by swelling of the eyelids and proptosis of the left eye. A few days later the right eye became similarly involved; chemosis was extreme, the cornea clear, and the pupils reacted to light. The temperature was 106° F., with delirium, restlessness, and incontinence. The orbital swellings were explored with a needle, and thick pus was found in the left side; an incision was therefore made, and an abscess cavity containing a quantity of offensive pus was evacuated in the posterior ethmoidal region. After this procedure a gradual improvement set in, first with regard to the cerebral symptoms, temperature, etc., and later of the eye condition, with a temporary check due to the formation and drainage of a subperiosteal abscess in the superior maxillary region. The patient was eventually discharged at the end of four months.

#### CASE XI

C. E. Benjamins[7] in 1931 reported the case of a 15-year-old boy admitted with a history of three years' otorrhoea and ten days' pain and fever, followed by swelling behind the right ear and upper part of the neck. Operation disclosed the presence of cholesteatoma, and the lateral sinus was covered with granulations and thrombosed. The radical operation was completed. Exploration of the swelling in the neck revealed no pus. Bacteriological examination showed Gram-negative diplococci, streptococci, and fusiform bacilli. Later an abscess formed on the neck; this was opened and drained. The

internal jugular vein was inspected and found normal. Oedema appeared in the right upper eyelid, to be followed shortly by chemosis and proptosis; the left eye became similarly affected. Both orbits were explored and pus liberated; a parotid abscess made its appearance, likewise one in the parapharyngeal space—this was opened and drained. At one stage violent headaches and vomiting suggested intracranial complications. A small flow of pus from the depth of the mastoid wound necessitated exploration of the middle and posterior fossae, but no abscess was located. Eventually the case progressed to complete recovery with the exception of total loss of vision in the left eye.

#### CASE XII

Larsen[9] in 1932 recorded the case of a boy of 4 years admitted with a history of an acute right middle-ear suppuration of four weeks' duration, with headaches and rigors during the last week. On admission the patient was pale and cyanosed. The right eyelids were swollen, and the pupils were equal and reacted to light. The right mastoid was explored and pus evacuated. Thirteen days after operation, after a sudden rise in the temperature, the mastoid was reopened. Puncture of the lateral sinus showed blood, and exploration of the middle and posterior fossae was negative. The temperature became intermittent, with rigors, sometimes lasting half an hour, dyspnoea, and a feeble pulse. The oedema of the eyelids began to subside and then swelled up again, with intense chemosis and proptosis. On the forty-seventh day of illness there was a spontaneous rupture of an abscess through the temporal side of the right orbit, after which the patient's condition began to show an uninterrupted progress to recovery.

### The Author's Case

The following case from my own experience completes this category.

#### CLINICAL HISTORY

The patient, a married woman aged 26, was admitted to the Worcester Royal Infirmary on November 1st, 1934, with the following history.

She had been slightly deaf in the left ear as long as she could remember. Four weeks earlier she noticed an offensive discharge from this ear, accompanied by malaise and a rise of temperature, but there was no pain or tenderness. Her doctor suspected a mastoid infection, but the condition appeared to settle down and the discharge ceased. There were two attacks of "shivering" during this period. Three days before admission she had an occipital headache followed by swelling in the right orbit. Examination showed considerable swelling of the right upper and lower eyelids with some proptosis. There were no nasal symptoms suggestive of disease in the accessory sinuses and the nasal mucosa was normal in appearance. *X*-ray examination showed no opacity in any of the accessory sinuses.

Ears: Both tympanic membranes were thickened and showed a large central perforation. In the left side there was a small amount of thick offensive discharge, but no granulations or cholesteatoma.

| Hearing: 36 inch watch. | A.C. | B.C. | Rinné | C.V. |
|---|---|---|---|---|
| Right, 1 ft. 6 in. | – | + | – | 6–8 ft. |
| Left, light contact. | – | + | – | 1–2 ft. |

Weber's test referred to left side.

There was no nystagmus and no tenderness over the mastoid. The temperature was 102° F., pulse 104, respirations 24.

Blood count: Red cells, 3,800,000 per c.mm.; colour index, 0.52; mean diameter of red cells, 7.17 $\mu$. White cells, 39,000 per c.mm.: polymorphs, 92 per cent.; lymphocytes 7 per cent.; mononuclears, 0 per cent.; basophils, 0 per cent.; eosinophils, 0 per cent. Haemoglobin, 40 per cent.

*November 2nd.*—Blood culture: Sterile after five days' inoculation. Left eye beginning to swell. Swelling of left temple, and complains of pain in the left side of face and neck.

*November 5th.*—Ophthalmologist's report: "Marked chemosis and injection of conjunctiva. Swelling of right lids. Proptosis of right eye. Pupil reactions normal. Disks pale. Case strongly suggestive of early cavernous sinus thrombosis." Expectant treatment was adopted.

*November 8th.*—A large, tense swelling appeared in region of left lateral lobe of thyroid. This was incised, under gas, and about two ounces of thick offensive pus were evacuated. A rubber dam drain was inserted deeply into the wound. At 6.30 p.m. there was a severe rigor lasting twenty minutes. Temperature 104° F.

*November 10th.*—Ophthalmologist's report: "Both pupils react to light. Proptosis of right eye has increased during the past five days, and there is now definite proptosis of left eye. The veins of the fundi are tortuous, but within the limits of normality. Both disks show a lack of vascularity, and there is some swelling of the upper pole of the left disk. The ophthalmoscopic signs strongly suggest cavernous sinus thrombosis."

*November 11th.*—Neck wound draining freely.

*November 12th.*—Large brawny swelling has appeared in the left posterior triangle of the neck. Temperature 101° F.

*November 13th.*—As the patient's general condition was improved, it was decided to explore the left mastoid and neck wound. The mastoid process was small, acellular, yet markedly vascular. The lateral sinus exposed far forward was obviously thrombosed. This was opened and a solid clot was found but no pus. Radical operation was completed. The anterior triangle of the neck was opened up by extending the incision for draining the abscess; a large abscess cavity was extending up to the base of the skull. The internal jugular vein was found collapsed and was ligatured at either end. The swelling in the posterior triangle was incised, but no pus was found.

*November 16th.*—Ophthalmologist's report: "The proptosis of the right eye is subsiding, but there is some exposure keratitis."

*November 18th.*—A small abscess pointing in the left upper lid was incised and some thick pus evacuated.

*November 20th.*—The patient was making steady progress. The temperature and pulse had settled to normal, and the wounds were draining and healing satisfactorily.

*November 30th.*—Ophthalmologist's report: "The right proptosis has completely subsided, but there is still some in the other eye. Engorgement of ciliary veins on nasal side of left eye; wrinkled appearance of retina around disks. Relative pallor of left disk. Limitation of left adduction. Engorgement of all anterior ciliary veins except in the upper and outer quadrant. ? Thrombosis of superior ophthalmic vein."

*December 12th.*—Patient was discharged from hospital.

*January 16th.*—Ophthalmologist's report: "Eyes normal except for relative pallor of left disk and some contraction of field. Vision 6/6."

### Commentary

Although there has been no opportunity of verifying the facts in this case, there would appear to be little reason to doubt that this represents a genuine case of cavernous sinus thrombosis of the subacute or chronic compensatory type, and that the course of infection was as follows. A primary infection of the left middle ear, or a flare-up of a latent chronic infection in that region, led to an infection and thrombosis of the lateral sinus and jugular bulb. An extension of the thrombosis via the inferior petrosal or the internal carotid plexus to the posterior part of the cavernous sinus gave rise to signs of venous stasis, first in the orbit of the opposite side, and, later, to that of the same side. This upward extension of the thrombosis was probably not septic, or at any rate not sufficiently so to precipitate the infection of the meninges, which is the usual sequel to such cases. The centre of the infective process in the vein would appear to have been in the jugular bulb, or below that level, terminating in the large abscess which pointed in the neck and was evacuated. The collapse of the internal jugular vein and an aseptic thrombus at a lower level saved the patient from the grave results of a descending generalized blood stream infection.

The surgical measures adopted in this case would appear to have had little share in what proved to be practically a self-limiting infection. A well-formed abscess was

opened in the neck and another in the orbit, and a radical mastoid operation, which disclosed the thrombosed lateral sinus and the primary source of infection, was completed, but otherwise the patient herself had limited and overcome what might have proved a fatal infection.

## Prognosis and Treatment

As may be expected, the acute fulminating type of cavernous sinus infection holds out the least hope of response to any form of treatment, and this is certainly borne out by the very small number of recoveries which have been recorded. Such cases appear to have responded as well to general blood stream therapy as to surgical operation on the cavernous sinus itself, and it is probable that a combination of these two methods of treatment may lead to better results in the future in dealing with this desperate condition. In the more chronic types of cavernous sinus invasion of aural origin it would appear that there is nothing to be lost and much to be gained by adopting an expectant attitude. The thrombosis in these cases is of a protective nature and is sometimes aseptic; to interfere with this process by a direct attack on the sinus itself would be to court disaster.

It must be remembered that the clot itself is not the embodiment of the disease, but is the natural protection, *par excellence*, against the fatal spread of the infection. The primary focus in the middle ear, or mastoid, should, of course, be dealt with surgically at an early date, and any abscess which has formed due to local necrosis or breakdown of clot, whether in the orbit, lateral sinus, or jugular vein, must be given adequate drainage. By far the majority of recoveries from cavernous sinus thrombosis of this type have been treated in this way, and these results must be regarded as the due reward of restrained and conservative surgery directed at assisting the natural efforts of the body without incurring any undue risks in a grave condition by more heroic measures.

## Surgical Methods

As regards the surgical treatment of the cavernous sinus itself there are several methods of approach:

1. Through the sphenoidal sinus. The restricted field and the difficulty of illumination, even by Cushing's technique, render this method unpopular.

2. Through the floor of the middle fossa. This is an extensive undertaking, and in none of the recent cases has this method been adopted.

3. Through the orbit, by opening the outer wall by an osteoplastic flap and removing the eye. This appears to be the method of choice, though often a sound eye has to be sacrificed; Christophe considers that this should not always be necessary.

Eagleton was the first to insist upon not only the eradication of the primary focus and drainage of the route of invasion, but also the necessity of putting the inflamed cavernous sinus at rest by ligation of the internal or common carotid artery, thereby eliminating those currents and eddies which are set up within the sinus itself by the transmitted pulsation of this artery. This analogy with the treatment of phlebitis in any other region of the body would appear most rational, but it does not seem to have become a regular procedure in the cases studied since his publication. Lauwers[11] and Christophe[2] adopted this measure in conjunction with exposure of the sinus by the external orbital osteoplastic flap. Although Eagleton decries the proposed dangers of this procedure, he quotes three cases resulting in severe cerebral complications, hemiplegia, etc., attributing these, however, to other factors; but such possibilities should make the surgeon tend to reserve this procedure for the more desperate type of case.

## Transfusion and Vaccine Therapy

The importance of both a daily blood culture and a daily differential blood count is stressed by this author in discussing the all-important question of diagnosis and subsequent treatment. His experience has convinced him of the value of using for transfusion blood from immunized donors. These are injected from time to time with minimal doses of a mixed stock vaccine prepared from the organisms usually responsible for infections of the ear, nose, and throat. Just prior to transfusion a larger dose should be given intravenously, either of the mixed vaccine or, when possible, of an autogenous one from the patient's own organisms. In this way both agglutinins and bacteriolysins are increased in the donor's blood, and this is of the greatest importance in treating the desperate type of acute case.

## Summary

1. A review of the cases of recovery from cavernous sinus thrombosis shows no more than seven which might be described as the acute infective type.

2. Of this number three were treated by direct operation on the sinus itself and four by general blood stream therapy.

3. A combination of these two methods, together with ligature of the internal or common carotid artery, is indicated if better results are to be obtained in future.

4. Approximately thirty cases have been reported of the chronic compensatory type, and of these two have been treated by operation on the sinus itself, one by blood stream therapy, and the majority of the remainder, including a case of the author's, by expectant treatment and by accessory surgical measures for the eradication and drainage of the primary focus, channels of invasion, and formed abscesses.

5. A very few cases have recovered spontaneously.

I should like to express my indebtedness to Dr. Sinclair Roberts and to Dr. Patten for their helpful co-operation with regard to the ophthalmic condition, and to Dr. Stewart for his assistance in presenting the pathological reports.

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M. K. Öke (*Deut. med. Woch.*, April 10th, 1936, p. 577) discusses the differential diagnosis of ovarian haemorrhage and acute appendicitis in the light of five cases, recorded in detail, and of the literature. He concludes that the escape of blood into the free peritoneal cavity gives rise to a peritoneal reaction simulating so closely that of acute appendicitis that it is difficult to distinguish between them. In all his five cases acute appendicitis was diagnosed by the physicians first seeing the patients and by himself. It seems that in such cases gynaecologists think first of an ovarian haemorrhage, presumably due to an extrauterine pregnancy, while the first thought of surgeons is appendicitis. A leucocytosis of more than 30,000 is held by some to suggest ovarian haemorrhage, but opinions are not unanimous on this point. To clinch the differential diagnosis by an exploratory puncture of the pouch of Douglas is not always warrantable, and may not yield decisive information. The author believes that only laparotomy can establish the differential diagnosis, and that the physicians and surgeons concerned should concentrate on the clinical indications for or against it.

# GASTRITIS IN THEORY AND PRACTICE*

BY

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More than one-quarter of all patients who consult the medical profession suffer from gastro-intestinal disorders, and the incidence of these affections is increasing under the stress of modern life. Often these disorders are minimal in their symptomatology, being regarded as minor maladies and correspondingly unimportant. Gastritis is a typical example, but its association with many serious and even lethal diseases, as revealed by modern clinical and experimental research, calls for a review of its position in medicine and for some attempt to assess its importance. In my review I shall stress certain aspects of the gastritis problem in which I have been especially interested due to my association with Professor M. J. Stewart, Dr. A. F. Hurst, and Dr. E. Meulengracht, to whom I shall ever remain indebted for inspiration and encouragement.

The clinicians of two or three generations ago used the term "gastritis" in a somewhat indefinite way to indicate a low-grade catarrhal inflammation of the mucous membrane of the stomach. A certain clinical symptomatology was described, and while there was much speculation no certain views existed as to pathology or aetiology. Wild and unsubstantiated speculations of Broussais and the French school had brought the subject into disrepute, and we find Trousseau,[1] although recognizing the disease, emphasizing its extreme rarity and doubting whether his students had ever heard it mentioned in their hospital practice. He says "to pronounce the word 'gastritis' is equivalent to a desire to renew a useless controversy raised by a defunct school."

Towards the end of the nineteenth century, however, the clinical diagnosis of gastric catarrh became more popular, especially as the "Magenkatarrh" of the Germans, and it was associated with a post-mortem condition of the stomach—the not uncommon, discoloured, autodigested, and gelatinous state of the mucous membrane. This was only later fully appreciated as being an artificial post-mortem appearance. So again gastritis and gastric catarrh fell into disrepute, for while pathology was making enormous strides in some directions, this condition had no certain pathology; the diagnosis, in fact, almost disappeared from current medicine, and was replaced to a large extent by "nervous dyspepsia." With this diagnosis presumably it was unnecessary to provide a pathological basis for the disturbance in the stomach.

As students we were discouraged from using the term "gastritis," and the chief reason for this was that the so-called inflammatory or atrophic lesions of the mucous membrane could not be demonstrated clearly owing to the rapid post-mortem changes. But already attempts had been made to overcome this difficulty and to obtain stomachs in such a state of preservation that it would be possible to distinguish between the changes due to gastritis and those due to autolytic digestion and hypostasis. Owing to the cloud under which gastritis seemed to lie, it was a long time before much attention was paid to these important observations in this country.

## Clinical Associations of Achlorhydric Gastritis

The first outstanding work was that of Hayem,[2] who introduced bichromate solution into the stomach shortly after death and so preserved the mucous membrane. Hayem gave a careful description of the various changes in the mucous membrane that accompany gastritis, and attempted to correlate them with changes in gastric secretion, which, with the introduction of the stomach tube, were then attracting attention. The important work of Faber[3 4] and the Scandinavian school followed his discovery that the injection of almost half a litre of 10 per cent. formalin solution through the abdominal wall into the peritoneal cavity and stomach preserved the mucous membrane in a very satisfactory manner for histological examination. Again attempts were made to correlate the histological appearances and the changes in gastric secretion, especially with those conditions where acid and pepsin secretion was diminished or abolished. The view gradually gained ground that there was always a definite underlying gastric pathology—chronic gastritis—responsible for achlorhydria.

This view—achlorhydria ex gastritis—must be contrasted with the view which was more widely held in this country, mainly owing to the influence of Hurst,[5] that achlorhydria results from an inborn error of gastric secretion. This constitutional gastric secretory defect may express itself very rarely as a congenital achlorhydria, but much more frequently as an inherent liability of the mucous membrane to fail to secrete acid if exposed to deleterious influences. Such influences would have little or no effect on, and would easily be resisted by, individuals not possessing this constitution, which has been called by Hurst the hyposthenic gastric diathesis. It will be seen that the two theories are not mutually exclusive. We shall discuss later how this theory of the constitutional gastric diathesis has been ingeniously extended to embrace certain other gastric secretory changes, but before doing so it is convenient to recall the important clinical associations of achlorhydric gastritis. They are:

1. Addisonian pernicious anaemia; subacute combined degeneration of the cord.
2. Idiopathic hypochromic anaemia of middle-aged women (the majority); simple achlorhydric anaemia of Witts.
3. Carcinoma of the stomach of the type following gastritis.
4. Ill-defined group: asthenic individuals the subjects of gastro-intestinal upsets, attacks of dyspepsia, diarrhoea, debility, and soreness of the mouth and tongue; also in a proportion of cases of rheumatoid arthritis, asthma, and allergic diseases, and Graves's disease, where its significance is doubtful.
5. After anastomotic gastric operations in a proportion of cases but by no means in all.
6. In individuals apparently in normal health but probably the subjects of symptomless chronic gastritis.

Within the last few years renewed attention has been given to the gastritis problem following the intensive studies of the gastric histopathology of fresh operation specimens of the stomach (Konjetzney).[6] This work has not only confirmed the histological descriptions of the mucous membrane of the stomach the seat of chronic gastritis, as described by Faber and his co-workers,[4] but has disclosed the fact that such lesions might be associated with peptic ulcer and carcinoma. In the case of peptic ulcer, where gastric acidity is certainly not abolished and is often increased, it was realized that here was gastritis *not* associated with depression of gastric secretion but frequently with the reverse condition—hyperchlorhydria. Another feature frequently noted was the presence of numerous tiny gastric erosions—particularly of the pyloric region. It had long been held that the genesis of an acute, and ultimately a chronic, ulcer was through the failure of healing and extension of one such erosion. In some of the operation specimens this was apparently happening, and all stages between an acute gastritis, acute haemorrhagic gastritis with erosions, acute, subacute, and more or less chronic ulcer, could be traced. Thus ulcerative gastritis and acid gastritis were

* A lecture delivered to the York Medical Society, February 9th, 1936.

described, accompanied by hypersecretion, and gastritis was given a new significance in the genesis of peptic ulcer. Instead of, as heretofore, the gastritis being secondary to the ulcer, the ulceration was secondary to the gastritis.

### Histological Changes in the Gastric Mucosa

The various histological changes met with in the gastric mucous membrane are manifold, and can be summarized only in a very brief way. The normal distribution of the various secreting gastric glands composing the normal mucous membrane must be briefly mentioned.

The digestive juice, by which one implies the acids and ferments, is secreted by the oxyntic and chief cells, which form tubular glands situated in the body and cardiac end of the stomach. In this region, therefore, the gastric mucosa consists of long tubular glands of closely packed cells with narrow septa and little interstitial tissue. Of the two well-defined types of cell, the chief cells are aggregated towards the base and the oxyntic towards the neck of the glands. These peptic glands are mainly responsible for the secretion of hydrochloric acid and ferments—pepsin and renin. They are gradually replaced towards the pyloric region by the so-called pyloric glands composed of an alveolar tubular arrangement of clear epithelial cells, very like those composing Brunner's glands in the duodenum. The pyloric region elaborates the specific intrinsic anti-anaemic factor, and it is believed that a pyloric secretion serves as a further stimulus to the acid secretion of the fundus glands (Meulengracht).[7 8]

So far as gastritis is concerned, the naked-eye appearance of the mucous membrane of the stomach may show acute or subacute inflammatory changes which give it a reddish appearance. The mucosa is often overlaid with a thick layer of mucus. According to naked-eye and microscopical inspection these changes may be local or general. The inflamed and reddened mucous membrane of the acute and subacute varieties may be confined to the pyloric region or spread over the whole corpus. Few or many scattered erosions may be seen, with tiny pin-head sloughs. The mucous folds may be thickened and hypertrophied, and occasionally mammillated. With the more chronic atrophic changes the mucous membrane is flattened, thin, and pale.

A variety of microscopic changes affecting the secreting cells are visible on examination, but for purposes of comparison we may first study the microscopical appearance of the normal healthy stomach. This shows no atrophy of the mucosa, no large mucus-carrying cells (beaker cells), only sparsely distributed and small lymphoid follicles, and little or no round-celled infiltration. The interstitial connecting tissue is small in amount, and the vascularity of the submucosa is not increased. These negative features of the normal stomach may be contrasted directly with the changes in gastritis. Microscopically the mucous membrane may show a variety of widely differing appearances ranging through inflammatory oedema, hypertrophy, to atrophy. Both hypertrophic and atrophic changes may coexist in the same stomach. The character of the individual cells is altered in the direction of cloudy swelling and oedema in the more acute varieties of gastritis, but in the chronic forms there is a separation, a thinning out, and a reduction of the number of glands composing the mucous membrane (atrophy). There is also an increase in the number of large mucus-carrying cells and regions of metaplasia, areas in which the gastric epithelium takes on an intestinal pattern.

All these changes occur, of course, at the expense of the normal gastric epithelium. In addition, there is an overgrowth of the interstitial connective tissue, with marked increase in the round-celled infiltration by lymphocytes, eosinophils, and plasma cells. The submucosa is thickened by round-celled infiltration and increased vascularity. A variety of names have been used to describe the forms of gastritis associated with these microscopical findings, and the following classification is based mainly upon the morphological appearance (Simpson).

| | | |
|---|---|---|
| Acute gastritis | Simple (parenchymatous) | Erosive |
| | Haemorrhagic | Erosive |
| | Membranous | Erosive |
| Subacute gastritis | Simple (parenchymatous) | |
| | Hypertrophic (mammillary) | |
| Chronic gastritis | Atrophic | |

### Gastritis and Gastric Secretion

The correlation of the newer discoveries concerning acid gastritis and peptic ulcer on the one hand, and achlorhydric gastritis and its clinical associations on the other, is incomplete. Porges[9] has put forward the view that gastritis localized to the pyloric end of the stomach may act as a stimulant to the acid secretion of the body and cardiac end. In this way pyloric gastritis becomes the precursor, if not the actual cause, of hyperchlorhydria. Faber[4] also emphasizes the difference between a local gastritis of this type—the aetiology of which, he suggests, may be chiefly mechanical, resulting in hyperchlorhydria and the peptic ulcer syndrome—and the generalized gastritis of toxic haematogenous origin affecting the whole gastric mucous membrane, and so resulting in achlorhydria.

Hurst,[5] on the other hand, has extended the theory of gastric diathesis to cover hyperchlorhydric and hypochlorhydric or achlorhydric secretory anomalies. This may be summarized as follows. Approximately 10 per cent. of the population inherit the hypersthenic gastric diathesis which is often obviously familial. They have short, high stomachs, rapidly emptying; are hypersecretory, but capable of forming little mucus in response to irritants; and when exposed to unfavourable influences, especially gastric traumata, tend to develop gastric and duodenal ulcer. Another 10 per cent. have the hyposthenic diathesis, usually with a long, low, slowly emptying stomach, hyposecretion, a tendency to secrete mucus if irritated, and, under unfavourable circumstances, tend to develop achlorhydria and those diseases associated with it.

This theory does not exclude the possibility of gastritis and its causes operating in either diathesis, but explains the particular end-result which gastritis is likely to achieve: that is, acid gastritis—hyperchlorhydria—peptic ulcer; achlorhydric gastritis—pernicious and other anaemias—carcinoma ventriculi, etc. It does mean, however, that acid gastritis is not the precursor of achlorhydric gastritis, a fact which I think is borne out by clinical experience. It explains, too, why in some cases of peptic ulcer a low normal or even hypo-chlorhydria is sometimes encountered. This must be due to the associated gastritis and mucus formation partially reducing the acidity. Further, it explains why, after medical treatment, the acidity may be higher than at the commencement, a not infrequently observed phenomenon, which is the result of the improvement in the associated gastritis.

Simpson[10] has shown experimentally in guinea-pigs and rabbits the importance of the acid factor, when there is accompanying gastritis, in producing gastric erosions and ulcer. Whereas a concentration of 2.5 per cent. HCl was required to produce gastric erosions alone, when an innocuous gastritis was induced a concentration of 0.182 per cent. (=50 c.cm. NaOH, which is only just at the high normal level) produced gastric erosions. Thus it would appear that, given hyperchlorhydria, any factor which precipitates gastritis—mechanical, thermal, toxic, or infective—may cause gastric erosions and their sequela—ulcer.

It is impossible to do justice in this paper to the other methods of investigating gastritis, and I can no more than mention that important contributions have been made following the adoption of special *x*-ray technique designed to reveal the outline of the mucous membrane of the alimentary tract (Forssell). A variety of pathological changes affecting the folds of gastric mucous membrane have been described, and the diagnosis of hypertrophic and atrophic gastritis may, in some cases, be made on *x*-ray diagnosis alone.

Equally it is impossible more than briefly to mention the important advances in diagnosis of gastritis which have followed the introduction of the flexible gastroscope. Definite gastroscopic pictures are seen corresponding to hypertrophic gastritis, ulcerative or erosive gastritis, and atrophic gastritis, and a conclusive diagnosis can be made on these appearances by those sufficiently familiar with them.

## Changes in Gastric Secretion

We shall next consider the alterations in gastric secretion which accompany gastritis. It has long been known that gastritis and hypochlorhydria or achlorhydria were associated, and the inference was that the effects of chronic inflammation of the gastric mucous membrane would be to depress its various secretory powers, this effect increasing with age. The fact that gastritis might be associated with hyperchlorhydria was something new, and we have mentioned the various theories of localized or pyloric gastritis (Porges,[3] Faber[4]) and gastritis in the constitutional hyperchlorhydric (Hurst[5]) which have been put forward to explain it.

I have long been interested in this problem from the point of view of gastric secretion, particularly since the introduction of the histamine test.[11 12 13 14] Some previously published work of mine suggested that good evidence of depression of gastric secretion could be obtained by the histamine method. Witts and I[12] had shown that a progressive depression of secretory capacity of the stomach was present in the various achlorhydric anaemias, and this was largely independent of the degree of anaemia existing. It could be demonstrated by physostigmine and histamine stimulation of secretion. The volume of gastric juice and its content of acid and pepsin appeared to be roughly progressively diminished through the hypochromic anaemias to the achlorhydria of pernicious anaemia.

It seemed of interest to investigate by this method a group of more or less symptomless achlorhydric cases (free from anaemia or cancer of the stomach), possessing in addition, upon *x*-ray evidence, the hyposthenic stomach, and a group at the opposite extreme possessing hypersecretory and hypersthenic stomachs. It was of particular interest to make quantitative observations on the amount of mucus which could be obtained in the two respective groups, in view of the extension of Hurst's hypothesis that the hypersthenic stomach was incapable of forming much mucus while the hyposthenic stomach produced mucus freely.

Our knowledge of the functions of gastric mucus has always been somewhat obscure. It has usually been accepted that an increased secretion of mucus is the normal response of the stomach to irritation of all types. Its presence in visible, naked-eye excess has been accepted as evidence of gastritis. Thus among 336 cases of achlorhydria investigated at New Lodge Clinic[16] a gross excess of mucus was noted in 85 per cent. Only rarely is mucus persistently lacking in such cases, and complete atrophy of the mucous membrane is thought to account for this absence. There are two varieties of gastric mucin: (1) the superficial secretion which is the ordinary, visible, test-meal mucus seen as a stringy, gelatinous material, usually floating on the top of the test-meal fraction; and (2) the deep soluble muco-protein.[15] The former can be precipitated by acetic acid; the latter cannot, and can only be estimated through its nitrogen or carbohydrate content.

The selection of group representatives of the hypersthenic diathesis was from cases of duodenal ulcer, twelve in all, nine men and three women, whose ages ranged from 27 to 60. Nine of the patients were symptom-free after medical treatment. Three had occasional discomfort of mild duodenal ulcer type but had been much improved by treatment, and their condition did not suggest active ulceration in the duodenum. They all possessed the high-lying cow-horn type of stomach with rapid emptying on *x*-ray examination, and all had hyperchlorhydria at some stage of the gruel test meal.

The patients representative of the hyposthenic diathesis were all achlorhydric in the gruel test meal, and had elongated J-shaped stomachs with less vigorous peristalsis on *x*-ray examination. Among them were four men and eight women, whose ages varied between 21 and 57. In four the condition was symptomless. Three of the women had mild hypochromic anaemia, which had responded well to treatment, and their blood was now normal, while five had indefinite dyspeptic symptoms, three with transient diarrhoea, and one had early chronic rheumatoid arthritis. The average differences in the gastric secretion following histamine stimulation are shown in the following table and diagrammatically in the figures. (Figs. 1 and 2.)

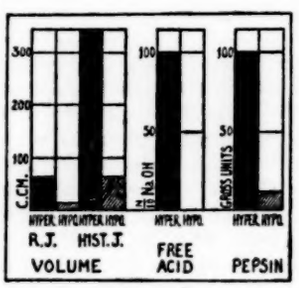


FIG. 1.

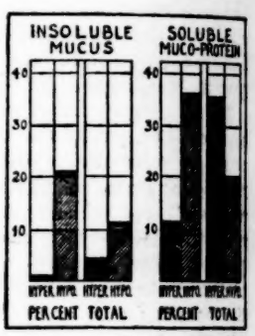


FIG. 2.

FIG. 1.—Diagrammatic illustration of the difference in volume, free acid, and pepsin secretion of the stomach after histamine stimulation in a group of patients possessing the hypersthenic and hyposthenic stomachs respectively.

FIG. 2.—Diagrammatic illustration of the difference in concentration of insoluble mucus and insoluble muco-protein in twelve patients possessing the hypersthenic and hyposthenic stomachs respectively.

| | Resting Juice | | Histamine Juice | | | | | | | Dose of Histamine (mg. Ergamine Acid Phos.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Mucus in mg. Nitrogen | | | | |
| | | | | | | Insoluble | | Soluble | | |
| | Volume | Mucus | Volume | Acidity N/10 NaOH | Pepsin Gross Units | % | Total | % | Total | |
| Hypersthenic Group (12 cases) | c.cm. 61.7 | — | c.cm. 343 | 101.5 | 98 | 1.31 | 4.32 | 11.3 | 35.71 | 0.9 to 1.0 |
| Hyposthenic Group (12 cases) | 16.4 | + | 57.3 | —* | 12 | 1.8 | 11.25 | 36.8 | 20.5 | 0.75 to 1.3 |

* One case produced a trace of free acid at the height of secretion, but not in titratable quantities.

It will be seen that histamine stimulation produced a very large volume of highly acid gastric juice of high pepsin content in the hypersthenic group, but only a small volume with no free acid and a low pepsin content in the hyposthenic group.

## Support for Hurst's Theory

With regard to the mucus findings, which were the chief point investigated, the method is possibly open to some criticism. It is obvious that the withdrawal of gastric juice through a Rehfuss tube, even by continuous

aspiration (as was used in these cases), fails to obtain the entire secretion. A certain amount is bound to be lost through the pylorus, and this will especially apply to the rapidly emptying active stomach in the hypersthenic group. More important in this investigation is the fact that it is impossible to withdraw all the thick, slimy, insoluble mucus which is secreted, probably over most of the surface of the stomach, although a fair sample of the soluble muco-protein is likely to be obtained. In interpreting the results we must remember that the insoluble mucus figures for the total output are likely to be low, especially in the hyposthenic group.

Taking the figures as they stand for mucus, it will be seen that the concentration of insoluble mucus in the hyposthenic group is sixteen times that in the hypersthenic group, while the total amount of insoluble mucus put out, calculated from the total volume obtained, is nearly three times as much (and may be more for experimental reasons mentioned) in the hyposthenic group as it is in the hypersthenic group, despite the enormous difference in the volume of juice secreted, which is nearly six times smaller in the hyposthenic stomach. With regard to the soluble muco-protein, the concentration is three times greater in the hyposthenic group, but the total output calculated from the total volume is one and three-quarters greater in the hypersthenic stomach. Since the insoluble mucus is that which is produced following irritation, these findings therefore support Hurst's thesis that the hypersthenic stomach is incapable of producing much mucus, while the hyposthenic stomach produces it in great excess.[5]

## Clinical Aspects

The clinical picture of acute or subacute gastritis brought on by some dietetic indiscretion—alcoholism, food poisoning, etc.—is fairly similar. Such attacks, even in individuals of normal gastric secretion, are accompanied by diminution or abolition of acid and pepsin secretion. In many of these cases the changes are only temporary, and if a histamine test is repeated some weeks later a return of secretion is found. I have personally observed this in four cases of acute alcoholic gastritis, in two of post-influenzal gastritis, and in one of post-pneumonic gastritis. The patient who is the subject of recurrent attacks of chronic gastritis may not infrequently masquerade as a middle-aged dyspeptic, and the attacks of dyspepsia which recur from time to time are characterized by nausea, lack of appetite, epigastric fullness, and flatulence. They may be called " gastric chill," " gastric catarrh," and " cold on the stomach," or even " liverishness."

In relation to the aetiology of this condition I should like to emphasize the importance of the gastric lesions that accompany influenza. I have now collected considerable histological evidence that severe grades of gastritis accompany the influenzal attack, especially where the gastric symptoms are marked. The diagnosis of " gastric 'flu " has for many years been derided professionally, but there is no doubt that the condition has as its basis a true gastritis. In this type of patient we perhaps do not recognize the frequency with which gastritis is associated with chronic infective conditions of the mouth, pharynx, upper respiratory tract, and accessory sinuses, nor perhaps do we appreciate fully the frequency with which gastritis accompanies general infectious states. In these conditions, especially, it is often latent and only discovered by routine examination. The occasional syndrome of achlorhydric diarrhoea in a proportion of cases of achlorhydria is now fairly well known. It is, however, important to stress the fact that achlorhydric gastritis may be clinically symptomless.

On the other hand, we have all met patients who suffer from dyspepsia of the ulcer type, the classically recurrent regular bouts of pain at a definite time after food, and we have perhaps realized that the individual attacks here have often been precipitated by an indiscretion of diet. We know, too, that not infrequently, even in the most typical " ulcer " cases, radiological evidence of an actual ulcer is not dependable, and even at operation sometimes no ulcer is found. These are the cases of acid gastritis and duodenitis.

With regard to the whole subject of gastritis, as recognized clinically, it is perhaps insufficiently realized that in spite of the fact that the dyspeptic manifestations appear to be of relatively minor importance, and are perhaps fairly easily symptomatically treated, a whole train of serious sequelae are apt to follow, ranging from anaemic states to carcinoma and peptic ulcer. It is therefore the prevention of gastritis, particularly in patients of the hypersthenic and the hyposthenic diathesis, which must primarily occupy our attention if these more serious diseases are to be avoided.

## Prophylactic Measures

It is a counsel of perfection to expect our patients to avoid all the possible causes of gastritis, and this is especially true of the toxic and haematogenous sources that are so common in general infections, but certain prophylactic measures can be adopted, especially if we have any evidence or suspicion that our patients belong to the hypersthenic or the hyposthenic group. These measures aim especially at reducing the irritation to which the inflamed gastric mucous membrane may be subjected, and they apply equally to either group of patients. Following a known attack of acute gastritis, the mucous membrane is especially vulnerable, and it is necessary that all factors tending to prolong the condition should be removed.

In the acute irritative stages the patient is completely rested, and no food is given for twelve hours other than fruit juice and soda-water. Vomiting, in so far as it helps in eliminating irritating material, is not at first suppressed by medical measures, but later, gastric sedatives may be required. Subsequently a bland and non-irritating diet must be selected which makes little demand upon the mechanical or digestive function of the stomach: non-irritating carbohydrates such as vegetable purées, fine gruel, citrated milk, rice, sago, arrowroot, cornflour, with cream and sugar. Abundant butter, cream, honey, lightly boiled eggs, and fish can be employed. The omission of irritant elements is very important. Alcohol, strong tea, and coffee should be prohibited ; only very moderate smoking, and none at all in the acid gastritis types, should be permitted, and no raw or green vegetables, salads, uncooked fruits with skins and pips, pickles, chutney, curry, new bread, pastry, muffins, hot buttered toast, and the like should be taken. Faulty habits of mastication and ingestion must be corrected. Meals should be small in bulk and taken in an unhurried fashion. Long intervals between food should be avoided: a glass of milk in the middle of the morning, in the afternoon, and in the evening is advised.

It will be seen that the mechanical ingestion and dietetic factors which have to be corrected apply equally to either group, but in the hypersthenic types the importance of the acid factor in addition has to be recognized and treated. This, of course, follows the principles well known in the alkaline medication normally employed when the ulcer has declared itself. On the other hand, in the hyposthenic group medical measures must be adopted to restore or substitute the diminished secretions.

All active forms of focal and open sepsis must be searched for and eradicated, especially in the mouth, pharynx, accessory sinuses, and respiratory tract. From such sources as these swallowed infected material comes in direct contact with an already damaged mucous mem-

brane, and in the reduction or absence of free hydrochloric acid infection may gain a permanent foothold, which, in the acid gastritis types, renders the development of a subacute ulcer from an erosion more probable.

When depressed gastric function is partially or completely established recourse may be had to local treatment by lavage in an attempt to restore to health those areas of gastric mucous membrane which are not totally atrophied. At the same time substitution therapy in the form of hydrochloric acid and pepsin by the mouth can be instituted. The effect of lavage is to remove sticky viscid mucus, retained food debris, and abnormal bacterial products, by which means the stomach is more completely rested, healing is augmented, and restoration of the normal secretion is helped. The efficacy of this treatment can be judged by the fact that out of thirty-four cases of achlorhydria in which this treatment was employed free acid returned in twenty-eight, or 82 per cent.[16] The best solution for gastric lavage is hydrogen peroxide, 1 drachm to a pint of warm water. The stomach is washed out every morning before any food is taken. After the first few treatments given by a physician many patients can be taught, and are quite able, to carry out gastric lavage alone.

A more simple form of lavage can be instituted by allowing the patient to drink about twelve ounces of warm water containing 1 drachm of sodium bicarbonate to the pint, the patient lying alternately for ten minutes on the left and right sides for about half an hour. Hydrochloric acid and pepsin can be administered in mild cases as the well-known mixture:

℞ Acid. hydrochlor. dil. ... ... ... ♏ x-xv
Tinct. nuc. vom. ... ... ... ... ♏ v
Glyc. pepsin. ... ... ... ... ʒ j
Inf. gent. co. ... ... ... ad. ʒ j
ʒ j t.d.s., a.c., ex aq.

or, in more severe cases, as a flavoured drink to be taken just before or with meals, according to the following (Hurst):

℞ Acid. hydrochlor. dil... ... ... ... ʒ j
Pepsin ... ... ... ... ... ... gr. v
Aq. ... ... ... ... ... ad. ʒ j
Take ʒ j and add a pint of water and the juice of two oranges.

The patient is ordered to take six ounces of this drink as stated before food. An alkaline mouthwash may be required in some cases to prevent any unpleasant action of the acid upon the teeth, or the mixture can be sucked through a straw. Individual patients may show different susceptibilities to this mixture, and some may require even greater dilution before they can tolerate it.

## Summary

The evolution of our knowledge of gastritis has been briefly traced, with special attention to the secretory changes with which it is accompanied, and we have seen that gastritis is important in modern medicine because it is a very common affection, having a multitude of aetiological factors and associated with a number of serious diseases, with which it stands in causal relationship.

That gastritis causes depression of secretion and eventually achlorhydric gastritis has been long known, but "acid gastritis" is of more recent discovery. Achlorhydric gastritis and acid gastritis tend to occur especially in individuals possessing the hyposthenic and the hypersthenic gastritis respectively.

Examination of the gastric juice secreted after histamine stimulation in a group representative of each constitutional type shows important secretory differences, which supports Hurst's theory of a constitutional gastric diathesis.

In both groups serious diseases are likely to supervene in the presence of gastritis: anaemia and cancer, etc., in the hyposthenics; and ulcer in the hypersthenics. Gastritis affecting individuals having a normal gastric constitution is less likely to be followed by these serious sequelae.

To prevent the sequelae of gastritis it is important to treat the disease in the earliest stages. The preventive treatment is largely dietetic, with the omission of all gastronomic iniquities; elimination of focal sepsis is important. Appreciation of the type of gastritis leads to recognition of the acid factor and its control by alkalis, or the achlorhydria and the consequent treatment by substitution with hydrochloric acid and pepsin, if lavage fails to restore secretion.

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# OBSERVATIONS ON THE INTUBATION TREATMENT OF PEPTIC ULCERS

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The treatment of peptic ulcers has always been a very difficult problem and a source of great controversy. An opportunity arose last year which enabled me to try the intubation treatment as suggested by Young.[1] This, in short, consists of the introduction of a small tube through the mouth into the duodenum to the distal side of the ulcer, and passing the "feed" through it. In a comparatively short space of time I had under my care twenty-five cases of gastric and duodenal ulcers.

In 1934 Bourne[2] published the results of the treatment of gastric and duodenal ulcers by duodenal feeding in twenty cases. He used as "feeds" milk, 8 ounces, and one egg, alternately with Benger's food (cooked for forty-five minutes) and half an ounce of cream, seven "feeds" being given in the twenty-four hours. In cases of undue loss of weight he added 4 ounces of sugar and 4 ounces of cream, distributed over the seven "feeds." Seventeen were cases of gastric ulcer and three of duodenal ulcer. If the pain was severe he gave alkaline powders by the mouth.

In the twenty-five cases which came under my care the intubation and general technique was carried out in the manner described by Bourne. Of these, fourteen were cases of gastric ulcer and eleven of duodenal ulcer. The sex distribution was: females twelve and males thirteen; and the age incidence 31 to 64 years.

## X-Ray Examinations and Haematemesis

Definite ulcers or incisuras were seen in fifteen cases—gastric six, duodenal nine. Tenderness or irregularity of the caput, but no definite ulcer or incisura, was observed in eight cases—gastric six, duodenal two.

Two patients had severe haematemesis and melaena; coagulin (ciba) was given until the haemorrhage ceased, which occurred in each case in about thirty-six hours.

The tube was then passed, and "feeds" were commenced. Melaena was present for a few days after treatment had begun. The loss of weight in these cases at the end of three weeks was 3 lb. in one case and 4 lb. in the other. These patients were not *x*-rayed until the end of treatment, but on the symptoms found were diagnosed as cases of gastric ulcer.

In two cases there were large ulcers present: one in an hour-glass stomach and the other in a very dilated stomach. In spite of every effort it was found impossible to pass the tube into the duodenum. In these cases the operation of jejunostomy was performed, and the patients were fed through a tube passed into the jejunum and with the same kind of "feed" as described later on. In four weeks the tubes were removed, and *x*-ray examination showed complete disappearance of the ulcer in both cases.

This, in effect, is the same treatment as that of Young, inasmuch as the "feeds" were introduced on the distal side of the ulcer, as already explained. All cases were *x*-rayed after treatment, and in every case no deviation from the normal was observed.

## Feeding

A calorie value of 2,000 per twenty-four hours was aimed at, which is laid down as a minimum for a resting individual, and several variations of food were tried. In working out the "feeds" it was necessary to take into consideration the bulk, calorie value, and small gauge of the tube. The maximum amount of nutriment that can be introduced without discomfort is 64 ounces in twenty-four hours—namely, eight "feeds" of 8 ounces each, given at two-hourly intervals, allowing for eight hours' sleep. It was necessary, therefore, to select foodstuffs of high calorie value which would pass through the tube easily.

In view of the experience of my colleague K. J. L. Scott and myself[3] I have used the following varieties of "feeds":

1. Milk, 8 ounces; glucose, 2 drachms; one egg; haliverol, 3 ♏; alternately with—milk, 8 ounces; glucose, 2 drachms, plasmon cocoa, 1 drachm; haliverol, 3 ♏.

2. Milk, 8 ounces; glucose 1 drachm; half an egg; haliverol, 3 ♏.

3. Milk, 8 ounces; white sugar, 2 drachms; one egg; alternately with—milk, 8 ounces; white sugar, 2 drachms; Benger's food, 1 drachm.

4. Peptonized milk, 8 ounces; glucose, 2 drachms; half an egg; haliverol, 3 ♏.

5. Milk, 8 ounces; glucose, 2 drachms; one egg; haliverol, 3 ♏, alternately with one "feed" of soya bean soup made with milk. Great difficulty, however, was experienced with this "feed," as the beans are very hard and dry, and have to be soaked for about two days. Notwithstanding this I cannot help feeling that the soya bean has the qualities of an ideal food for this purpose. Soon, I understand, we shall have the fresh bean available, as it is now being grown in this country.

My experience with the different diets tried is that the results were about the same, but in the event of our being able to obtain the fresh bean the results with that type of "feed" may be very different. On the whole patients appeared to tolerate Diet No. 2 the best. Three of the cases in my series, when given 8 ounces at a time, experienced unusual symptoms; they became cyanosed, complained of acute pain in the epigastrium, the pulse became irregular, they complained of palpitation, and vomited. The tube was brought up, accompanied by copious green vomit. After an interval of a few hours the tube was reswallowed. When the "feeds" were reduced to 6 ounces all the symptoms disappeared, and after two or three days it was found that 8 ounces could be tolerated again quite well.

No patient was able to take more than 2 drachms of either glucose or sugar at a "feed," since pain and general discomfort, followed by diarrhoea, resulted. The bowels were regulated by passing senna tea through the tube when required. Some of the patients complained of a certain degree of heartburn; for this one teaspoonful of MacLean's powder was given when required, but not regularly. When the powder was taken frequently, diarrhoea sometimes occurred; this was easily overcome by omitting the magnesium carbonate.

## Observations during Treatment

When severe pain was present this disappeared as soon as intubation was commenced. There was no real difficulty in passing the tube—except in the two cases mentioned. The throat was cocainized first in every case, and sips of water were given to help the swallowing. After the first twenty-four hours the tube was tolerated well, and no discomfort was complained of in the throat. The minimum time of twenty minutes was necessary for each "feed." After a few days patients were able to feed themselves quite easily.

In several cases the tube was apt to get blocked, and then it had to be removed, cleaned, and swallowed again. The blocking of the tube was obviated in the majority of cases by washing it through before and after each "feed" with 10 c.cm. of sterile water. In three cases the tube became blocked, and on removal was found to be tied in a tight knot. In one of these cases the patient, a man, when feeding himself suddenly experienced a peculiar feeling in his epigastrium accompanied by an explosive sound. I was surprised to learn that this sound was heard by all the other patients in the ward. When his tube was removed it was found to be tied in a very tight knot and a burst present just above the knot. These occurrences were probably due to excessive peristaltic action of the stomach and duodenum.

After the first week, which was spent in bed, the patients were able to be up and about most of the day. No feelings of hunger were experienced by any, but the men complained of not being allowed to smoke. The mouths caused no trouble, a simple mouthwash of glycerin thymol being used frequently.

The big loss of weight which is sometimes experienced during the ordinary diet treatment did not occur, the greatest loss being 5 lb. in three weeks. Loss of weight was observed in thirteen cases, the average loss being about 4 lb. Gain in weight followed in eleven cases, the average being about 1 lb. One case showed no change. The type of "feed" used appeared to make very little difference to loss or gain in weight.

Confinement to bed was only one week, instead of three or possibly longer. In all cases of severe pain there was complete relief immediately after intubation. After eight months only one patient had a return of symptoms; this was a case of a very old-standing gastric ulcer, and gastro-enterostomy had to be performed. In the two cases of severe haematemesis the ability to feed the patients immediately appeared to overcome the debility from loss of blood.

In my experience this method of treatment has many advantages over the ordinary routine treatment of rest in bed, milk, and alkaline powders.

### References

[1] Young, E.: *Practitioner*, 1928, cxx, 244. Young and Cordner: *Trans. Med. Soc. Lond.*, 1933, lvi, 133.
[2] Bourne, G.: "The Problem of Peptic Ulcer," *St. Bartholomew's Hospital Reports*, 1934, lxvii.
[3] Maile and Scott: *Lancet*, 1935, i, 21; ibid., 1935, i, 1500.

# THIRD-GENERATION SYPHILIS

BY

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The possibility of syphilis being transmitted to the third generation was, according to Cornaz,[1] first described by Van Helmont in the seventeenth century. Fournier[2] in 1891 was, however, the first modern syphilologist to draw serious attention to the condition, and although he considered it of infrequent occurrence he reported a large number of cases. Since that time the literature on the subject has grown mainly by contributions from abroad, the French being the chief workers in this field. With the exception of Nabarro, syphilologists in this country have given little attention to the condition. Nabarro[3,4] has collected thirty-one cases where the family history is available for three generations. In sixteen of these there was undoubted syphilis in the three generations, and in six syphilis was probably present. In the remaining seven it was possibly present. He adds to the first group two cases where both parents suffered from congenital syphilis. The evidence presented is in accord with modern standards of diagnosis. In this there is a sharp distinction from many cases reported by foreign writers, which fail to satisfy critical investigation, and where the diagnosis of syphilis in the third generation is made on slender clinical evidence.

## Diagnostic Criteria

For the diagnosis of third-generation syphilis Sams[5] has given the following criteria.

1. The diagnosis of syphilis in the third generation should be based upon a specific lesion, definite stigmata, or a repeatedly positive blood test.
2. Acquired syphilis in one of the grandparents (first generation), preferably the grandmother, must be established.
3. Congenital syphilis in one of the parents (second generation), and again preferably the mother.
4. Exclusion of acquired syphilis in both parents and children so far as is possible.
5. Certainty of parentage of the children in question.

Sams states that rigid adherence to these criteria makes it impossible to present a case which is beyond question, for it is obvious that the exclusion of acquired syphilis in the second generation can never be absolute. Nevertheless, he considers that reasonable satisfaction of the postulates given may be accepted as constituting proof of third-generation disease, and on these grounds the following case is deemed worthy of record.

## Case Records

The X. family were first investigated in May, 1934, by Dr. Hamilton Wilkie of Leicester, and I am greatly indebted to him for the details of his findings, which were as follows.

*First Generation.*—Father, aged 55, had strongly positive Wassermann and Kahn blood reactions, but showed no clinical signs of active syphilis. Mother, aged 56, had strongly positive Wassermann and Kahn blood reactions, and clinically showed signs of early general paralysis.

*Second Generation.*—The children of these parents were: Daughter, aged 32, who showed no serological evidence of syphilis. Daughter (Mrs. Z.), aged 27, who had strongly positive Wassermann and Kahn blood reactions, but presented no clinical signs of active syphilis. Son, aged 25, who showed no serological evidence of syphilis. Son, aged 23, who had strongly positive Wassermann and Kahn reactions. This man was found to be suffering from interstitial keratitis, and was the cause for the investigation of the remainder of the family. Son, aged 21, who presented no serological evidence of syphilis.

At the time of the investigation the daughter, Mrs. Z., was on holiday in Leicester, and was referred to the Colchester Clinic for treatment, commencing on May 13th, 1934. She attended regularly until February 1st, 1935, and during this period of treatment received the following injections: seven of N.A.B. (2.55 grams), eleven of stabilarsan (3.3 grams), and ten of bismostab (1.2 grams). The Wassermann reaction remained strongly positive during this period. In June, 1934, she became pregnant for the first time, and in March, 1935, was delivered of a living female child; a sample of placental blood taken by the practitioner in attendance at the delivery gave a positive Wassermann reaction (++).

The child, representing the third generation of the X. family, was brought to the Colchester Clinic when 6 weeks old. It was apparently healthy, but showed positive (++) Wassermann and Kahn blood reactions, findings which were repeated in a specimen taken a week later. Treatment was commenced for the mother and child, in the case of the latter with 0.005 gram kharsulphan weekly. As this drug was well tolerated, the dosage was gradually increased to the present one of 0.15 gram. Over the past six months twenty-two injections of kharsulphan have been given, a total amount of 1.18 grams; and on November 6th, 1935, the Wassermann and Kahn reactions were negative. On this date the serological reactions of the mother were still strongly positive.

The father of this child has a negative Wassermann reaction, and there is no evidence of his having had acquired syphilis.

Reviewing this family in the light of Sams's criteria it will be seen that the diagnosis in the case of the third generation is established by the two positive blood tests. There is definite evidence of syphilis in the grandparents, but the evidence of congenital syphilis in the second generation is not so clearly established. It depends on the presence of interstitial keratitis in one son and the findings in the case of the daughter, Mrs. Z.

It is possible for interstitial keratitis to occur in cases of acquired syphilis, but such cases are extremely rare. Carpenter[6] had three such in 19,000 cases of acquired syphilis, while Stokes[7] states he has never seen one, although he does not deny its existence. In the instance given I consider that as there is such definite evidence of syphilis in the first generation it is reasonable to affirm that the interstitial keratitis occurring in the second generation is a definite manifestation of congenital syphilis. In the case of the daughter, Mrs. Z., the persistently positive Wassermann reaction in spite of seventeen months' treatment points to a diagnosis of congenital syphilis. This contention is supported by her family history, the absence of miscarriages and stillbirths, and her husband's freedom from the infection. The final postulate laid down by Sams is satisfied in this case, as there is no doubt as to the parentage of the child of the third generation.

This case is therefore presented as one of third-generation syphilis.

I wish to express my thanks to Dr. W. A. Bullough, county medical officer for Essex, for permission to publish this case.

REFERENCES

1 Cornaz: *Rev. Méd. de la Suisse Rom.*, 1926, xlvi, 220.
2 Fournier: *L'Hérédité Syphilitique*, Paris, 1891.
3 Nabarro: *Brit. Journ. Ven. Dis.*, IX, 1.
4 Idem: *Acta Paediatrica*, 1933, xvi, 498.
5 Sams: *Amer. Journ. Syph.*, 1933, xvii, 492.
6 Carpenter: *Ann. Ophthalmol.*, 1908, xvii, 617.
7 Stokes: *Modern Clinical Syphilology*, 1926.

Dr. Anthony Bassler has been elected president of the United States Society for the Advancement of Gastro-enterology, president of the American Committee and United States Delegate to the International Society of Gastro-enterology, and an honorary member of the Belgian Gastro-enterological Society.

# Clinical Memoranda

## Vesico-vaginal Fistula: A New Operation

New operations often yield the best results in the hands of the particular individual who has elaborated them, and too frequently have no advantage over pre-existing ones. The operation to be described, however, has in its favour the following points. It dispenses with a somewhat complicated operation, takes only about five minutes' actual operating time, is extremely simple, and in the single case described gave an excellent result.

Formerly communications between the genital tract and the bladder were found most frequently after labour, but with the more frequent employment of Caesarean section in cases of disproportion these fistulae are now seen more often after extensive pelvic operations, or as complications of carcinoma of the cervix, etc.

Wyeth was the first to point out that following the use of diathermy there is a marked tendency for normal tissues to develop rather than excessive scar tissue, and that healing of a diathermy wound is actively taking place before the slough separates.

### CASE HISTORY

On June 12th, 1935, a female patient aged 39 had had a total hysterectomy under spinal anaesthesia. There was a considerable amount of oozing of blood after the operation, which was rather more difficult than usual, owing to the fact that the bladder was firmly adherent to the lower part of the uterus and upper part of the cervix. The vagina had to be packed and the patient put in Fowler's position. Before leaving the hospital she developed symptoms of what appeared to be a vesico-vaginal fistula. I saw her on September 3rd, and on inserting a speculum urine was seen coming down the vagina.

The patient was readmitted to hospital, and on September 25th a probe was introduced from the anterior wall of the vagina into the bladder. Cystoscopic examination showed a fistula running in from before backwards and to the left, and about half an inch from the posterior wall of the distended bladder, the opening in the vagina being less than a quarter of an inch from the apex. The bladder showed some cystitis, for which an autogenous staphylococcal vaccine was given. In view of the infected bladder an open operation might have been dangerous to the patient; therefore, as I have for some time been obtaining primary healing in cases of fistula-in-ano,[1] some definitely tuberculous, and in an obviously infected area, I thought the following technique might be worthy of trial.

### OPERATION

On September 27th I performed the following operation. A probe—insulated by rubber tubing—was introduced per vaginam, and the distal portion unguarded passed through the fistula. The cystoscope was then introduced, and it was seen that the free end of the probe was not touching the bladder wall. A coagulating current was applied to the proximal end of the probe for four seconds, the probe being then withdrawn. An indwelling catheter was stitched in. Bladder washouts were ordered, but unfortunately too large washouts were given.

*Seventh Day.*—Slight leak per vaginam. Washouts then reduced to 5 oz. A pint of sterile saline given daily, 5 oz. at a time.

*Eighth Day until Fourteenth Day.*—No leakage of urine per vaginam.

*Fourteenth Day.*—Catheter removed. Patient discharged from hospital.

[1] Mein, W. Arch: "Electro-Surgical Treatment of Minor Anal Conditions," *British Medical Journal*, 1933, ii, 332.

*October 24th, 1935.*—There has been no leakage of urine since. It is now nearly two weeks since patient's discharge from hospital.

*March 24th, 1936.*—Six months after, no recurrence.

### CONCLUSION

In view of the extreme simplicity of this operation I am emboldened to publish these preliminary notes of only one case in the hope that other surgeons will try it, especially in those cases where it is impossible to bring down the vagina, owing to adhesions following hysterectomy, and where the situation of the fistula is such as to necessitate with any other method an intra-abdominal operation.

The leak on the seventh day was expected, as from the seventh day to the tenth day diathermy sloughs usually separate. Elsewhere in the body I have found this period fairly constant.

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Bournemouth. F.R.C.S.Ed.

## Peritonsillar Abscess in Infancy

The publication by Alex Maclean in the *British Medical Journal* of August 10th, 1935, of an article under the above title, and the extreme rarity of the condition, prompt me to publish the following case.

### CASE RECORD

A Chinese male infant, born on July 22nd, 1935, started running a slight temperature on September 17th. During the previous two or three days it had fits of crying, which did not worry the parents. On the 19th the family doctor was called in, and he diagnosed pneumonia. Two days later the condition of the baby was much worse; it had been unable to suckle its mother for two days, and the parents noticed "a lump on the tongue." As the family doctor was out of town one of us (M. S.) was called in at 11 a.m.

On examination the baby was found to be very restless and dyspnoeic. The temperature was 101° F., there was a slight watery discharge from the nose, and the glands in the left submaxillary region were enlarged. Tubular breathing was heard at both bases, but no rales. The "lump on the tongue" proved to be the enlarged tonsils, almost meeting each other. Owing to the mucus present no membrane could be seen, but nevertheless a diagnosis of diphtheria was made, and the parents were advised to take the infant to the Local Government Civil Hospital as intubation or tracheotomy might be required at any minute.

When the child reached the hospital at 12.30 the medical officer (R. C.) found that it was cyanosed and gasping for breath. Breath sounds in both lungs were almost absent: the picture was one of respiratory distress. The throat was examined: a swelling was discovered in the left tonsillar region pushing the left tonsil across the middle line and obstructing the fauces.

A diagnosis of quinsy was made. Owing to the urgency of the case a sharp probe was hurriedly sterilized and thrust into the swelling. A large quantity of pus shot out, and five minutes later the child was breathing normally and the lips had regained their normal colour. Within twenty-four hours the temperature had fallen to normal, and the child was discharged at the request of the parents. Two days later we were informed that the child was quite well and the submaxillary swelling had disappeared.

### COMMENTARY

The above case is interesting in: (1) The record age (just under 2 months) of the patient. In the literature searched by Alex Maclean the youngest child was 9 weeks old. (2) The presence of an early collapse of the lung, which must have misled the family doctor into making a diagnosis of pneumonia.

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# Reviews

## A SYMPOSIUM ON ENDOCRINOLOGY

The problem of the adequate presentation of modern knowledge on any subject becomes increasingly difficult. Not only is this so because of the enormous mass of established facts, but also because of the necessity of bringing to the notice of student and investigator observations which require confirmation and further study, and which may open up new fields of importance. For the non-specialist to attempt this task for the whole range of endocrinological research is well-nigh hopeless. All that can be expected from such a writer is that a more or less coherent account be presented of modern work, illustrated here and there by personal experience. On the other hand, the specialist in one field will feel dissatisfaction from being forced to accept the work of others without experimental verification by his own hands. Every teacher feels this dissatisfaction when lecturing on subjects with which he has acquaintance only from study of the literature. Of course this is unavoidable in the case of the teacher, and he must rely on his experience in one or more branches of research to enable him to sift the evidence and extract the significant truths. That such compilations are rarely satisfactory has evidently been recognized by the American Medical Association, for in a recent symposium[1] the method has been to have each branch of the subject treated by a well-known worker in that branch. To avoid the tendency of the specialist to expand into great detail, it is evident that he has been asked to crystallize his knowledge in such a way as to give an impression of the solid ground gained and the lines of advance along which research is being pursued. There is no doubt that this has been admirably done. In his introduction Dr. Fishbein points out that the Council of Pharmacy and Chemistry undertook the publication of this series of articles in 1924 as an attempt to counteract the "tremendous abuses already evident in the use of preparations of glandular materials promoted by pharmaceutical manufacturers who were willing to exploit such preparations on slight evidence." The work has, we are glad to say, gone much further than this, in that it has led to what must be regarded as a very valuable addition to the literature of endocrinology. We are not a little doubtful whether it will have any effect in diminishing the abuses referred to. To demonstrate that a given preparation does not possess the active hormones that the scientist associates with the glands from which it is made carries no weight with a patient who has, on the statistical evidence of one case or perhaps two, been able to associate the improvement or cure of a real or imagined ailment with the swallowing of such a preparation. On the whole, we are not inclined to lay stress on the propagandist element of this admirable publication, but would draw the attention of all serious students of the endocrines to the excellence of its summaries of modern knowledge in a most complex field.

[1] *Glandular Physiology and Therapy*. A symposium—Prepared under the Auspices of the Council on Pharmacy and Chemistry of the American Medical Association. 535, North Dearborn Street, Chicago. (Pp. 528. 2.50 dollars.)

## FAMILY MEDICAL INSURANCE

It is safe to say that the scheme of *Family Medical Insurance* in the particular form in which it is set forth in Dr. J. LACHLAN-COPE'S booklet under that title can never successfully mature. What is new in the scheme is impracticable and what is practicable in the scheme is not new. It is true that existing insurance schemes for medical attendance and health promotion, whether under State, professional, or voluntary lay auspices, do not embody all the practicable features of the particular scheme now set forth; but every such feature has at least been considered, discussed, and worked out in some detail in connexion with proposals for the extension of existing schemes, and almost all of them are now awaiting only improved financial conditions, and in some cases legislative action, to be put into actual working. Everyone agrees that the present national health insurance service is seriously imperfect in at least two respects: it does not include the families or dependants of employed persons; and it does not provide for consultant and specialist advice and treatment, pathological investigation of all necessary kinds, and some other desirable auxiliaries. At the present moment conversations with a view to the early removal of the latter want are in an advanced stage of progress. Further, similar movements towards the extension of public medical services under the auspices of the medical profession itself, both to wider areas of the country and to classes of the community with annual incomes larger than those prescribed for persons coming under national health insurance, are in active operation; and contributory schemes or provident schemes on an insurance basis for institutional treatment are multiplying, and steps are being taken towards their active co-ordination. It is on such practical lines as these that progress towards a complete national health provision is to be looked for. Nothing has yet appeared which invalidates or offers a real alternative to the scheme outlined in the British Medical Association's proposals for a "General Medical Service for the Nation."

In his booklet[2] Dr. J. Lachlan-Cope prefaces the points of his scheme by various observations under the headings of "Introduction" and "Evidence." Neither of these words is exactly appropriate to what is said under it: the latter is especially mischosen. There is nothing to be said against the aims which the author sincerely has in his mind and heart; but neither the statement of these aims nor the presence of admitted imperfections in the existing state of affairs is evidence in support of his particular proposals for achieving or for meeting them. He pays pen-service, doubtless genuine, to the position of the general practitioner as the "hub" (perhaps a better word than "backbone") of the profession, but he appears not to realize the high quality and the width of field of the services of most such practitioners; he underrates their skill both in diagnosis and in treatment; he seems to appreciate very little the great extent of their influence and work in the preventive field; and he apparently considers that they can have no proper place in the work of any kind of institution or clinic except that of recommending patients to them. In fact, most of the author's general statements may, at this stage of the discussion, be regarded as either axioms or platitudes, while, in detail, he shuts his eyes to many of the more encouraging features both in modern medical practice as now ordinarily carried on and in the organized movements towards making it more easily and fully available for all classes of people.

Dr. Lachlan-Cope has been encouraged to present his scheme in printed form by a number of appreciative, though guarded, expressions of opinion from some well-known members of the medical profession. We gladly join in appreciation of any thoughtful contribution to the discussion of social medicine such as is found in this booklet, but we must, in duty bound, call attention to the serious imperfections, both of thought and of expression, which it manifests.

[2] *Family Medical Insurance. A New Scheme with Evidence.* Collated by Dr. J. Lachlan-Cope, B.A. London: John Bale, Sons and Danielsson, Ltd. 1936. (Pp. 64. 2s. net.)

## TUBERCULOSIS IN HISTORY

Clio, particularly Clio Medica, is a jealous muse, and History makes fools of us all. The perpetual flux of opinion through the centuries on this omnipresent and protean disease ought to make the reader of Dr. GERALD WEBB's excellent handbook[3] wonder what progress means. Perhaps this: that we have crystallized our conceptions, what we know and what we don't know. The Hindus knew of consumption; it was rare at certain periods in Egypt and Syria. Hebrew had no word for a cough. Hippocrates had a good knowledge of the clinical features, but his humoral outlook handicapped early pathology. Then the word consumption threw a cloak over the special features, though scrofula was accurately studied, royally touched, and mysteriously ascribed. Laennec discovered the unity of tubercle and Villemin proved experimental transmission.

What happened after Koch is more or less familiar to us, and to-day, in refinements of tuberculin and its protein fraction, we are back in a new sea of confusion, with allergy (a term invented by von Behring) as our guide. The brief chapter on "climate" reflects our confusion. Is the high altitude of the mountains more favourable than sea-level? Hours of sunshine and relative humidity seem to have influence when large numbers are examined, but what about the deleterious effects of sunlight on the average pulmonary case? Even our sanatoria seem to be changing into elaborate hospitals, and the sterner forms of open-air treatment are not where they were.

Meanwhile, the disease in this country is being overthrown, and, barring a new war, poverty, or influenza of exceptional virulence, we may look towards the end. This astonishing history is well told in 200 pages by Dr. Webb, who entertains us with pictures, one or two interesting graphs of the incidence at particular periods (are they too speculative to be reliable?), and gives an adequate bibliography.

## ABNORMAL BLOOD PRESSURE

The suggestion that a sphygmometer record is a necessary part of a clinical examination hardly needs emphasis nowadays. It is, however, not so certain that the details of the physiological mechanism that produces the record are fully appreciated, and undoubtedly the figures, whatever they be, often present a clinical problem that is by no means free from practical difficulties. These two positions are carefully studied by Dr. EDWARD J. STIEGLITZ in a volume entitled *Abnormal Arterial Tension*[4]—one of a series of monographs issued under the editorial direction of Dr. Morris Fishbein. The special feature of the book is the association of the analysis of the physiological mechanism responsible for the sphygmometer reading with the causes which disturb this mechanism and the clinical situations which arise from such disturbance; in this way is illustrated the relation between physiological doctrine and practical medicine. And, it may be said at once, the author proves himself equal to his task—alike in knowledge, in personal experience, and, above all, in the art of lucid exposition. On the subject of blood pressure, as the term commonly runs, Dr. Stieglitz has provided exactly what the medical practitioner desires.

While with the modern instrument a reading of the blood pressure is readily obtained the figures compel two questions. One of these is, What is the normal reading? And the other, Given an abnormal reading, and particularly an abnormally high reading, what does this signify in relation to prognosis, and what does it demand in the shape of treatment? Though admitting, as everyone must do, that there are, or appear to be, exceptions, Dr. Stieglitz is emphatic that "a systolic blood pressure of 150 or more and/or a diastolic pressure of 95 or more constitutes hypertension"; that such figures mean a definite risk of aggravation, slow perhaps, but almost inevitable; and that only by recognition in the early stages of the condition can the physician hope for appreciable therapeutic success. The difficulty is to catch the early stage, for its victims are not only free from disturbing symptoms but, as a matter of fact, have often a robust sense of general well-being. Hence it is usually only some odd chance that brings them under medical observation; and here is the plea, as Dr. Stieglitz urges, for periodic clinical examinations, and this not merely in middle age but also at a much earlier date.

On the subject of treatment the book is very full and serviceable, and it does not hesitate to give adverse verdicts when these are required; with so many confident commercial competitors in the field these judgements are very helpful. Drugs have their place, though not a pronounced one. Above all, the emphasis is on early detection and a regime which will tend to prevent or delay the translation of arterial spasm into arterial degeneration and the disasters which wait on this. On all these and related points Dr. Stieglitz's pages may be consulted with advantage.

## THIRTY-SIX YEARS

The post-war generation has already produced a good many autobiographies, though it cannot conceal its boredom when its parents or grandparents do the same, especially if they venture on that démodé topic the War itself. Faced with yet another one, the middle-aged may start with a prejudice against the *Silver Fleece*,[5] not unlikely to be lessened by a pretentious and irrelevant title and a dreadful publisher's blurb. For all that, they can be strongly advised not to miss Dr. ROBERT COLLIS's book, which is quite a different affair from most of the bright young people's productions. When he gets to twice his present age we hope the author will write a sequel, though we do not guarantee that he will better this account of the experiences he has managed to pack into the first thirty-six years of his full and varied life. At his best he writes a limpid English prose of real charm and felicity, which might be taken for that of a master craftsman artfully concealing his ingenuity but for the facts that he is rather slow in getting into his stride and that now and then he lapses from his normal standard.

Robert Collis just missed the war by the skin of his wisdom teeth, played Rugby for Cambridge and Ireland, held research studentships in London and in the United States, and was one of the earliest adherents of Dr. Buchman in England, of all which things he tells sanely and modestly. His football stories—he and G. S. Conway were awarded simultaneously the first two Rugger Blues given at Cambridge after the war—are excellent. He plumps for W. W. Wakefield as the finest forward he has ever played with or against; and his account of the famous drawn international match at Twickenham in 1925 could hardly be improved. It was a great "come-back" to play for Ireland after recovery from erythema nodosum and from a pleurisy which required paracentesis and was thought to be tuberculous (on erythema nodosum he afterwards did research work, by the way). An excellent sketch of the life of a resident house-officer in a big London general hospital will appeal, perhaps, especially

[3] *Tuberculosis*. By Gerald B. Webb, M.D. New York: Paul B. Hoeber, Inc. 1936. (Pp. 205; 17 figures. 2 dollars.)

[4] *Abnormal Arterial Tension*. By Edward J. Stieglitz, M.S., M.D., F.A.C.P. New York: National Medical Book Company Inc. 1935. (Pp. 261; 66 figures. 4 dollars net.)

[5] *The Silver Fleece. An Autobiography*. By Robert Collis. London: T. Nelson and Sons, Ltd. 1936. (Pp. 290; illustrated. 15s. net.)

to the laity: to the profession it may be rather disturbing to discover that at the attached medical school scholarships were frankly given for athletic rather than for academic attainments.

Dr. Buchman he soon perceived to be an astute psychologist but a poor theologist. Using a gift of logical thinking more to be expected of a Lowland Scot than of an Irishman, the young Collis soon saw too many fallacies in Buchmanism to remain long in that camp; but he says nothing unkind either of Buchman himself or of his faithful followers. Though he dissects the Irish character with a mordant candour which might be ill-received from an Englishman, he yet is so devoted to his country and his people that at the first opportunity of a career there he incontinently threw up all his London chances, steadily and honestly worked for, and shook the dust of England off his shoes in favour of dear dirty Dublin. It is quite certain that all who read this jolly, light-hearted, interesting book will wish him long life and the best success there—and not sufficient disillusion to prevent him from writing another volume of the *Silver Fleece* when he gets to three-score years and twelve.

## Notes on Books

In the *1935 Year Book of Pediatrics*,[6] which marks the thirty-fifth anniversary of the volume of the Practical Medicine Series, Dr. ISAAC A. ABT, assisted by Dr. ARTHUR A. ABT, gives an excellent survey of the progress made at home and abroad in the various departments of children's diseases, exclusive of orthopaedics, which has been dealt with in a separate volume since 1924. The important subject of infant feeding is prefaced by an interesting historical sketch by the senior editor. The other subjects which receive most attention are: intestinal disturbances, gastro-intestinal disorders, infectious diseases, the nerves and mental system, diseases of the blood, and genito-urinary diseases.

*A General History of Nursing*[7] is now published in a cheaper edition. The author, Mrs. SEYMER, brings to her task the combined qualifications of academic scholarship and experience of practical nursing. She traces the history of her profession from its earliest origins, through the dark periods of mediaevalism to the present day. There is an excellent chapter on the work of Florence Nightingale, and a full survey of the widespread ramifications of modern nursing. The illustrations consist of photographs and a number of interesting old woodcuts. This book, which is well written and well constructed, merits the attention of medical readers.

Whenever one of the branches of science displays rapid and sudden growth on the experimental side the brains of our phantasmagorists will not be satisfied with the newly discovered facts. It will not take them long to grow a new, speculative branch which, though hardly able to keep alive for lack of roots, will try to overshadow the mother plant. The public, always in danger of being confused by speculative writers, soon takes the fantasies for facts, and its gratitude is due to a scientist who gives a concise outline of what is known and an equally concise demarcation of what is doubtful or unknown. It is in this way that in 250 pages Dr. B. P. WIESNER deals with the matter of sex.[8] The book is that of a biologist. Although dealing in parts with matters difficult for a lay reader to understand, Wiesner succeeds in keeping up a clear style and a well-disciplined train of thought. He leads his reader deep into the intricate maze of sex biology problems, but never fails to let him know what is fact and what theory and speculation.

[6] Chicago: The Year Book Publishers; London: H. K. Lewis and Co., Ltd. (Pp. 520; 96 figures. 2.25 dollars, or 9s. 6d., postage 6d.)

[7] *A General History of Nursing*. By Lucy Ridgely Seymer, M.A., S.R.N. London: Faber and Faber Ltd. 1936. (Pp. 307; illustrated. 7s. 6d. net.)

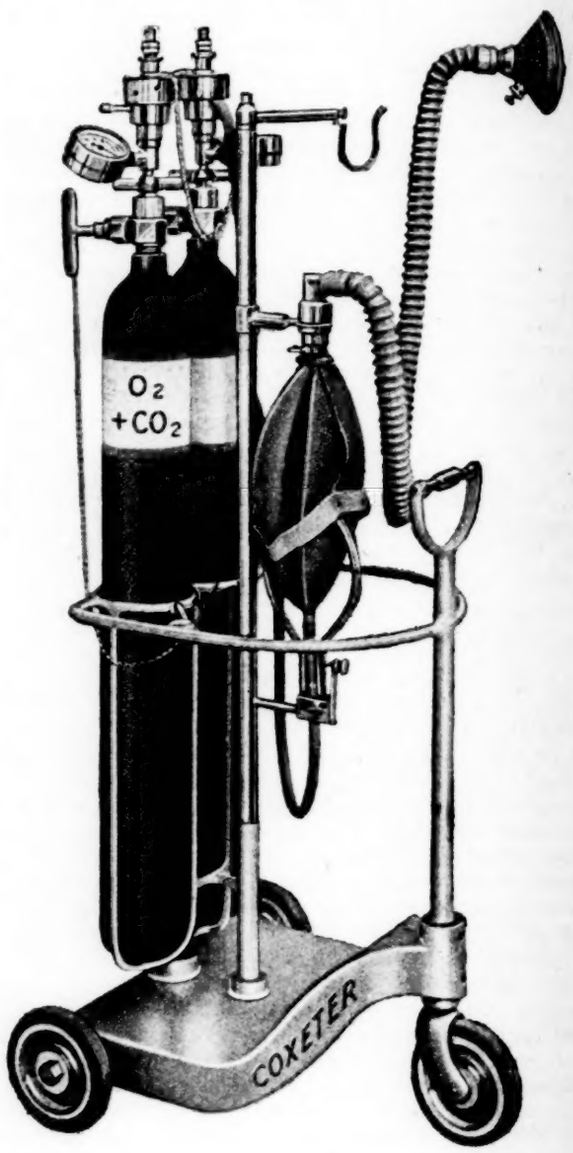
[8] *Sex*. By B. P. Wiesner, Ph.D., D.Sc. Home University Library. London: Thornton Butterworth Ltd. 1936. (Pp. 256. 2s. 6d. net.)

## Preparations and Appliances

### CODOX APPARATUS

Dr. J. N. DEACON, *M.C.* (medical superintendent, Redhill County Hospital, Edgware), writes:

The value of inhalations of a mixture of oxygen and carbon dioxide gas in cases of hypostatic congestion of the lungs, poisoning with coal gas or narcotics, and after upper abdominal operations and general anaesthetics given to elderly persons, is well established. In some hospitals, in spite of the existing apparatus being cumbersome and, in the hands of nurses, apt to get out of order, these administrations are routine. It was felt that given a more simple and portable apparatus this




valuable therapeutic measure would be more widely adopted. With the help of Messrs. Coxeter and Son Ltd. a simple, strong, and readily portable "codox" apparatus has been produced. Mounted on a heavy base with three 6-inch rubber-tyred wheels are two 20-foot cylinders of $O_2$ and $CO_2$ mixture, each with an Adams reducing valve and pressure gauge. These connect with a rebreathing bag, having a special control for automatic filling and a lung-operated valve. A corrugated delivery tube with mounts, a malleable face-piece with sponge-pad and adjustable expiratory valve, and a T-key complete the machine. Its action being lung-governed gas wastage is eliminated, and in comparison with that used hitherto the apparatus is cheaper to run.

# THE REFORM OF MEDICAL EDUCATION*

BY

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In medicine to-day men's minds are turning more and more to the study of health as a means of preventing disease. If preventive medicine, however, is to hold the field as it should, there is a wide and increasing recognition of the need for reform of medical education. The general practitioners of the future will be the medical backbone of the country. My object in this communication is to present a brief summary, largely of the views of others, on this subject, with a brief reference to difficulties in securing reform, and the need for united effort on the part of all who are interested in the different aspects of health questions—public and private—towards obtaining the end desired.

Forty years' experience of medical practice, including the medical work of a large teaching hospital, has revealed to the writer the fact that the results of the curative treatment of the ordinary medical conditions, which fill our hospital beds to-day, have been, to too great an extent, a failure, probably due in the main to the fact that treatment is so largely directed to the end-results of disease. By comparison, surgical results have been much more spectacular. Here, however, in a very large proportion of cases surgery deals mainly with the end-result of disease without contributing anything of material value towards the removal of the fundamental causes of the disease. To illustrate: the admission of cases of appendicitis and of adenoids to the Royal Infirmary Edinburgh, increased from eighty-two and forty-seven in 1896 to 1,634 and 2,157 in 1934.

## The B.M.A. Report

A specially noteworthy contribution on the subject of Reform of Medical Education in recent years has been an authoritative report by the British Medical Association. This report, as finally approved and adopted by the Representative Body of the Association—virtually a Parliament of over 300 members embracing every section of the profession—in July, 1935, is now before the General Medical Council, which is now sitting (May 27th). (Since this paper was read a published summary of the final findings and recommendations of the General Medical Council† has appeared in the *British Medical Journal* of June 6th.) The essential feature in the recommendations of the British Medical Association may be briefly summarized. The present curriculum has become needlessly and unwisely specialized, and fails to meet the needs of the general practitioner of the future. It is, to too great an extent, framed to meet the views of those who attach too much importance to "curative" medicine and too little to the pre-eminent value of "preventive" medicine. It is out of touch not only with the opinion of a very large body of the profession, but is out of line with the outlook of the public authorities on national health questions, to an extent which must materially retard the nation getting the best return for its increasing expenditure on national health services.

An abbreviated summary of the opinions of expert authorities on the subject is here presented, the first series of opinions being extracted from "Reports on Medical Education and the Need for its Reform," published in the Quarterly Bulletin of the Health Organization of the League of Nations, 1932–3.

* Abstract of paper read, by invitation, to the Annual Congress of the Royal Institute of Public Health and Institute of Hygiene, held in Edinburgh, May 28th, 1936.

† There are only four representative medical practitioners in the list of forty members.

## Medical Education in England

Sir GEORGE NEWMAN, K.C.B., M.D., *late Medical Officer of the Ministry of Health and of the Board of Education, England*

"It is assumed that prevention and prophylaxis is the function of the public medical officer and is necessary only for a diploma in public health. There never was a greater misapprehension. Every patient asks two questions: 'Can you put me right? Can you tell me how to prevent this happening again?' It is the universal cry, and yet *the student is not taught preventive medicine.* It is even confused with public health and sanitation. *Yet the final objective of all practical medicine and surgery is prevention. The preventive spirit should permeate the whole curriculum and inspire every subject in it.*"

"The subjects of the curriculum in almost all countries are all too often taught in watertight compartments, whereas all the subjects should be integrated into each other, the biology into the anatomy and physiology, and both into the pathology and clinical subjects. They are interdependent upon each other and incomprehensible apart from each other. Further, the student is left to assume that all parts of the curriculum are of equal importance. But they are not. Some parts are preparatory to the final products—merely its scaffolding—other parts are vital and essential."

"The examination system as at present conducted is a thraldom which leads instead of following the teaching in our medical schools. The examination should be not a trial of memory only, but a test of knowledge, training, practice, and experience—and it should include marks for work done throughout the curriculum."

"Obviously curative medicine and remedial surgery must have immediate priority, but the ultimate goal is prevention. It is not the event of death which we can escape, but the incidence of unavoidable invalidity and premature death."

"The student is insufficiently trained in ante-natal and post-natal supervision."

"We are turning out too many theorists with a mass of undigested data, and too few resourceful practitioners who know how to treat properly the first patient who comes."

## Medical Education in France

A.—Professor G. ROUSSY, *Member of the Academy of Medicine; Member of Council of Public Instruction and Public Hygiene, France*

"The reform of medical teaching is the order of the day in many countries."

"The evolution and constant progress of medical science; *the new trend of modern medicine, which has hitherto been essentially curative but is becoming to an ever-increasing extent preventive and social*; the need for States and administrations to have at their disposal a body of doctors versed in all questions connected with collective medicine; the ever-growing number of medical students at the large universities, making methods of instruction increasingly difficult—all these factors make the question one of primary importance to-day."

B.—Dr. ETIENNE BURNET, *Pasteur Institute, Paris; Expert Attached to the Health Organization*

"Curricula are becoming more and more overloaded in order to keep up with scientific and technical progress. The students learn too much and know too little."

"If only piecemeal improvements are made in the existing curricula, the dissatisfaction which is everywhere felt will not be remedied."

"Preventive and social medicine must now begin to play their proper parts, and should form the keystone of the whole edifice. The idea of preventive medicine should permeate the whole of medical education."

## Medical Education in Austria

Professor TANDLER, *Professor of Anatomy at the Medical Faculty of Vienna University; Chief of the Social Welfare Department*

"Complaints regarding the inadequacy of medical education and proposals for reform in this sphere were already heard before the war, and have since become much more clamant."

"New regulations for studies and examinations have been issued from time to time, after long and wearisome discussion, but no appreciable progress has been achieved."

"*It is time that medicine was regarded from the point of view of the requirements of the patients and not from that*

*of existing chairs.* We must have the courage to jettison superfluous medical knowledge, which seldom, if ever, proves useful in practice. I myself, as a professor of anatomy, am convinced that many chairs of anatomy suffer from an excess of anatomical instruction."

"The essential thing in medical education is to distinguish, in the education of the future doctor, between theoretical instruction in medicine and training with a view to his future profession. *There must be no compromise here, and it is that tendency to compromise, so characteristic of our time, that renders such a reform difficult, not to say improbable.*"

### "The Student in Irons": The Curriculum

A striking article by Dr. C. M. WILSON, dean of the Medical School, St. Mary's Hospital, London, was published in the *British Medical Journal* in 1932, and attracted considerable attention. One or two extracts from the introductory part of that article are here given.

"The one purpose of students' years, it seems, is not to train and test habits of thought but to collect and store a set of facts as squirrels hoard the nuts on which they hibernate. These facts are his capital, and he must perforce live on it throughout his working life, for he has not been put in the way of adding to his possessions as time passes. Presently it shrinks, and he must needs replace it by a stock of worldly wisdom upon a growing discernment of the ways of human nature, so that soon he is as cunning in the management of men as he is helpless in the control of their diseases."

"What is needed is not patchwork but something that smacks of revolution, *something like a recasting of the whole of our studies*—that only such be kept as help towards broad educational ends. Can we look to any committee to show us a way out of the tangle?"

### The Undergraduate Point of View

The subject has also come under the consideration of various undergraduate societies in London, Edinburgh, and South Africa, from which an extract may be given.

In March, 1933, one of a series of meetings promoted by the Students' Representative Council of Edinburgh University was held in the Union and addressed by Dr. C. M. Wilson, Dr. Elliot Dickson, member of the committee of the British Medical Association responsible for the report of that body, Dr. Wilkie Miller, president of the Edinburgh Medical Practitioners' Association, and Dr. Dalgliesh (M.B., Ch.B. 1932), late member of the Students' Representative Council of Edinburgh University, the speeches and discussions being summed up by the present writer and followed by a resolution moved by students in the following terms, which resolution was later forwarded to the University Court:

> That this House places on record its opinion that the present system in this country is unsatisfactory. In its opinion important changes in the curriculum are essential, whereby more facilities for instruction in practical medicine are available, and more assistance given in the principles and practices of preventive medicine. The time required for this additional teaching can, in its opinion, be obtained by a judicious modification of the teaching in the earlier scientific subjects, with some revision of the time and attention devoted to the teaching in the "specials" department of medicine and surgery.

It may be added that this subject is again under the consideration of a recently appointed Reform Committee of Students' Representative Council members.

### The General Medical Council

Medical education in this country is regulated by the General Medical Council under the aegis of the Privy Council. In their consideration of the present demand for reform the Council have already pointed out that "they have to keep in mind the needs of their working within the provisions of the Medical Acts." As far back as 1918 the need for reform was raised in the Council itself in a motion by two members for "taking action towards promoting and systematizing the teaching of preventive medicine in the medical schools and in clinical hospitals throughout the country." As a result of prolonged inquiry by special English, Scottish, and Irish committees, new regulations were laid down in 1922, these new regulations embodying some valuable recommendations in regard to the teaching of preventive medicine. In actual practice, however, these recommendations would appear to have been, for all practical purposes, ignored. The Council does not, it appears, have the power to enforce its own regulations. In May, 1935, the General Medical Council published an interim report of a special Curriculum Committee of their number, which was appointed to look into the subject and report on the present position.

For immediate practical purposes a summary of the main conclusions arrived at by this committee, from their "careful consideration of the many criticisms of the present curriculum and the suggestions which have been put forward for the improvement of medical education," are as follows:

"The committee have carefully considered the many criticisms of the present curriculum and the suggestions which have been put forward for the improvement of medical education."

"There does not appear to be a substantial body of criticism of the basis of the system of the curriculum, or of methods of medical education general in this country."

"The committee are of opinion that medical education in this country will be best advanced by developing and improving the existing system."

From these conclusions it seems clear that the General Medical Council is not greatly impressed by the series of widely expressed criticisms emanating from the influential and authoritative sources on record. *These findings of the Council will undoubtedly suggest in many minds the query as to whether the Medical Acts do not require amendment.*

The foregoing summary of medical opinion shows beyond all manner of doubt that there is a very substantial body of opinion in the profession that the basis of the system of the present curriculum, and of the methods of medical education associated with it, are *not in keeping* with the present-day needs of the student and of the nation.

As the General Medical Council is substantially made up of representatives from existing universities and teaching schools, it would be fitting if, in the meantime, one of the older universities, mindful of some of the great traditions of the past, were to give the necessary inspiring lead.

### Movement in Canada

In the *Canadian Medical Association Journal*, March, 1936, it is reported that a "reorganization of the medical curriculum" has just been arranged, and comes into operation this autumn. This has developed as a result of "an effort to determine how the curriculum may be readjusted to the professional, social, and economic changes that are everywhere in progress," and has arisen out of "the increasing social consciousness of the need for the promotion of health." Details are not given of the nature of the changes, or the manner in which the difficulties incidental to this movement have been overcome.

### Conclusion

The subject is one of great national importance. If the nation is serious in its attack on the health problem and is to proceed on business-like lines in its endeavour to advance the national health, the first desideratum is the adjustment of modern medical education to the present national needs. There must be no compromise on essentials. The "reasonable and insistent demand" involved in the admirable report of the British Medical Association merits the very close attention of the nation and of the legislative bodies concerned in education.

After lengthy discussion the following resolution was unanimously adopted:

> That this meeting is of opinion that the time has arrived when the curriculum for medical students should include more specific training in preventive medicine, and urges the General Medical Council to revise the courses accordingly.

It was agreed to forward this resolution to the General Medical Council and the Privy Council.

British Medical Journal

SATURDAY, JUNE 13th, 1936

# TAR AND VIRUS IN CARCINOGENESIS

Cutaneous papillomas in domestic animals, especially in dogs and cattle, have long been known, and that they are caused by viruses has been demonstrated by many observers. It is only in the last three years, however, that their importance in the experimental study of cancer has been brought to light by investigations carried out at the Rockefeller Institute by Dr. R. E. Shope and by Dr. Peyton Rous and his co-workers. The researches began with an observation by Dr. Shope[1] that the virus which causes endemic papillomatoses in cotton-tail rabbits of Western America will infect the epithelium of the skin of domestic rabbits. The infection is brought about by scarifying the skin and rubbing into the abraded area either extracts of papillomas which have been stored in 50 per cent. glycerin, or filtered extracts of fresh papillomas of the cotton-tail rabbit. The incubation period varies considerably; in American domestic rabbits it is from seven to twenty-one days, in English rabbits it varies from three to eight weeks. The virus causes proliferation of the epithelial cells by mitoses in the basal layer and the rete malpighii ; the growing epithelium extends downwards to the fibrous corium and laterally under the adjacent epidermis. Eventually a fleshy growth, usually with a dry surface, projects from the skin.

Rous and his collaborators[2] have made a careful study of this virus-induced papilloma. They have shown that when fragments of the papilloma, obtained so far as possible free from contaminating micro-organisms, are transplanted into the muscles or internal organs of the same rabbit—that is, an autoplast—the transplanted epithelial cells multiply and form tumours which are invasive and destructive, and which frequently cause death. Such tumours may be regarded as artificial metastases. When such a tumour is removed by operation it tends to recur. In morphology the tumours are epidermoid cancers. These experimental findings have their counterpart in a fairly common clinical observation in papillomatosis of the bladder. When such tumours are removed by the suprapubic route the abdominal wall is sometimes accidentally contaminated by fragments of the growth; these fragments multiply and form a tumour which is microscopically a carcinoma. It has been shown further[3] that the papilloma in domestic rabbits usually progresses by continuous alterations in the epithelial cells of the growth into a malignant tumour. In a group of ten rabbits carrying papillomas for more than six months cancer developed in seven. When malignancy supervenes invasion of the neighbouring lymph nodes takes place, and eventually, if the rabbit is permitted to live long enough, metastases form in the lungs.

Similar cancers of the skin can be induced by painting rabbits with coal tar. The earliest change brought about by the tar is hyperplasia of the epithelium, followed by the formation of papillomas. This usually takes place within three months. If the application of the tar is then stopped the papillomas usually retrogress. In order to obtain true malignant new growths it is necessary to continue painting the skin with tar for a long period of time, usually from one to three years. When malignancy occurs the tarred areas thicken, local invasion takes place, and neighbouring lymph nodes become enlarged by growth of deposits of malignant cells.

Rous and Kidd[4] have recently published an account of experiments in which they have combined these two methods of producing skin cancer in rabbits—namely, with coal tar and virus. Rabbits' ears were painted with tar for about three months in order to bring about hyperplasia of the epidermis. Then papilloma virus, obtained by filtering a saline extract of a papilloma of a cotton-tail rabbit, was injected intravenously. During the next fortnight—the average incubation period of the virus—nothing happened beyond the usual slight enlargement of existing tar papillomas, or the occurrence of fresh ones, on the areas painted with tar. Then in many of the rabbits the tar papillomas " underwent extraordinary alteration, becoming within a few days discoid, beefy, and infiltrative." The tarring was discontinued, but the tumours continued to enlarge. New tumours of obvious malignancy arose on the tarred areas where no tar papillomas had been visible. The malignant tumours that had formed so dramatically were highly anaplastic epidermoid cancers, which rapidly led to death. It is perhaps too early to discuss the significance of this brilliant experiment, but it appears to be obvious that coal tar prepares the epithelial cells for attack by a virus which has a specific affinity for the epidermis.

[1] Shope, R. E.: *Journ. Exper. Med.*, 1933, lviii, 607.
[2] Rous, P., and Beard, J. W.: Ibid., 1934, lx, 701.
[3] Idem: Ibid., 1935, lxii 523.
[4] Rous, P., and Kidd, J. G.: *Science*, 1936, p. 468.

# ENDOCRINES IN PRACTICE

Notwithstanding centuries of descriptive anatomy of the brain and spinal cord little progress in the knowledge of diseases and affections of the central nervous system was attained until the methods and results of experimental physiology threw a new light on clinical problems. In the case of the endocrine glands even anatomists paid little attention to these small and often insignificant portions of the body, hidden and dispersed without any apparent correlation ; and it was the clinicians who made the first step towards the establishment and grouping of the syndromes associated with those glands whose secretions affect and control other parts of the body. The physician observed a complaint

with defined symptoms. On the death of the patient a lesion of an organ was discovered, thus relating the function of this organ to the symptoms. The physiologist then removed this gland or organ, noting how results fitted in with the symptoms of the disease ; and the biochemist was called in later to extract from the gland a substance which could compensate for its removal or offer means of treating the complaint. These stages of discovery have occurred repeatedly in endocrinology, which should be one of the most precise of the sciences, founded as it is on pathology, anatomy, physiology, and chemistry. But though much information is already available the present state of our knowledge of the endocrine glands leaves much room for further work. Three factors contribute to bringing this about. The glands themselves are scattered in a haphazard manner in the body, as if Nature had used any odd site on which to build a factory. Sometimes, as in the suprarenal and pituitary, two portions of the same gland have quite diverse functions. In the suprarenal gland Nature has apparently put side by side a power station and a sewage farm. Unfortunately, the field of investigation has often been encumbered through bad work by uncontrolled experiments and false hypotheses. We know enough, however, to recognize to-day the great importance of the endocrine system in the conservation and defence of the individual and the race.

In one of the excellent series of Initiations into Medicine, Professor Noel Fiessinger has brought together the essential facts of endocrinology.[1] As he is addressing students beginning their clinical work his summary of the anatomy and physiology of the endocrine glands should suffice to remind them of all the necessary knowledge. From many of these glands the active principle has been isolated, including the antitoxic principle of the adrenal cortex and the tension-regulating factor of the medulla; thyroxine, with its effect on the metabolic rate ; parathormone, with its influence on calcium metabolism ; insulin, the controller of carbohydrate assimilation; the important hormone of the posterior lobe of the pituitary gland, with its action on plain muscle tissue and excretion of urine; and the two hormones of the ovary, the one producing signs of oestrus and the other favouring the retention and growth of the ovum in the uterus. Of others, such as the pineal body and thymus, the exact function is at present unknown.

In disorders of the endocrine glands the objective signs are more prominent than the subjective symptoms. Disturbances of growth and development, especially at the epochal times of life, bring about alterations in stature and corpulence of the body and in the pigmentation and hair of the skin. Local signs occur in the eyes and neck in exophthalmic goitre; polyuria in diabetes insipidus and mellitus; alterations of primary and secondary sexual characteristics in affections of the gonads and pituitary; and changes in the bony skeleton in association with pituitary and parathyroid disorders. Even the mental state of the patient may be profoundly modified in regard to excitement, brilliance, or lethargy. Subjectively a ready fatigue is experienced in many forms of endocrine disturbance, and the patient may even himself be aware of the emotional irritability which is a common feature of many of these disorders. Chemical and biochemical methods are available to aid diagnosis. The basal metabolic rate, the plasma content in phosphorus and calcium, the capacity to assimilate, store, and use sugar, the alteration in growth or reaction of individual tissues of experimental animals are all studied and measured, and further laboratory methods are being explored.

Some of the more common forms of disorders of the better-known endocrine glands are now established as clinical entities. The disturbance may take the shape of an excess or deficiency of function, and when pronounced there may be little difficulty in diagnosing a clear-cut case. But besides these states of gross pathological disorder there are many others in which the signs are indefinite, the pathology obscure ; as if the endocrine disturbance had not yet, as it were, crystallized out. These may resemble irregularly the fully developed condition, but the diagnosis, and consequently the therapeutic indications, may lack precision. Further, in such an interrelated and complex mechanism as the endocrine system, pluriglandular manifestations may and do occur. Professor Fiessinger, from his wide experience, cites further difficulties. There may be, usually as the result of infection, repercussions on the endocrine system from disturbances of metabolism which are not primarily of endocrine origin. Following an attack of typhoid fever, or immobilization from accident, or after pregnancy, over-feeding and reduced effort and exercise may bring about such a state of obesity, somnolence, fatigue, and, in women, amenorrhoea, as to simulate a gonadal or thyroid deficiency. Business anxiety or continued emotional tension may bring about such loss of weight, low blood pressure, tachycardia, and unfitness that hyperthyroidism is suspected. It is necessary to separate out the exogenous cause and to establish the extent of the disordered endocrine function before sound prognostic and therapeutic indications are available. Treatment of the endocrine disorders should include the revision of the habits and general state of the patient, as well as the attempt to control the glandular disturbance present. This may be done either by supplying a defective secretion or controlling an excess by radiotherapy or surgery. Thus the body possesses a whole series of interrelated organs whose function it is to control and equilibrate ; with increasing knowledge there should be earlier recognition and earlier attempts at rectification of disturbances of this delicate mechanism. The nature of the symptoms produced by endocrine disturbance, the comparatively slow evolution and tendency to familial involvement, make this field for observation and research one that is eminently suitable for the general practitioner.

[1] *Endocrinologie.* By Noel Fiessinger. Collection des Initiations Médicales. Paris: Masson et Cie. (20 fr.)

# THE IDEA OF THE SPA

The therapeutics of *place* has been recognized in all ages, but its scientific basis is still imperfectly understood. In all countries there are places with the natural endowments of *preventoria* or convalescent centres—some with medicinal waters, others, on the coasts, moors, or mountains, with recuperative climates. These places offer to their visitors many opportunities for mental and physical restoration, which are certainly not less needed in modern life than in the past. The most obvious service they can give in the present day is to meet the need of busy people for an annual vacation or holiday. A periodical break of custom is the great opportunity for return to simplicity of life. It is an instinctive escape from routine, a change of air and scene and companionship, with rest and pleasant exercise in the open air. Of such a sort, for young people, are the camps for boys or girls in the American forests or on lake shores, or farms, or in England for scouts and guides. At all health resorts it should be possible for the tired worker to obtain, under medical guidance, that something *more* than a holiday which will safeguard his health for another year. Another boon with more limited medical objective is that of the climatic health resorts, where the quality of the air is the curative influence—on plateaux, at medium altitudes, or higher in the mountains. In seaboard countries, again, and especially in the British Islands, the various types of marine climate, with sea-bathing and swimming, make a great contribution to preventive medicine and to the convalescence of invalids of all ages.

A little analysis will show that all climatic resorts, operating on a changed manner of life, possess in varying degree two governing qualities—as centres of rest and centres of movement. It is a fundamental law of physical medicine that contact of the body with external energy accelerates or retards its physiological functions. The best places for convalescence are those in which rest and activity are skilfully alternated and applied in the process of recovery. At a recent conference of the British Health Resorts Association at Llandrindod Wells the spas of a country were described by Colonel Byam as the "specialists among the health resorts." This idea has lately been carried a little further in a suggestive address to the London Publicity Club by Mr. John Hatton of Bath. Spa waters, if they have special qualities, must needs have particular applications. It is the aim of a properly appointed spa by its own systematic method to restore or maintain health. It may be that its chief contribution to medicine may be to serve as an "overhauling and repairing depot" for the breakdowns of middle life. In any case all will agree that the spa method is "powerful, delicate, and complex."

This idea of the spa suggests that the direction of these methods in the future must become more and more an expert matter, in establishments strengthened by official approval. Moreover, the requirements of invalids are so varied that the spa, in addition to its specialist service, must develop the curative background or atmosphere. The individual character of the place, whether town or countryside, has a strong appeal, and special care should be given to the entertainment of the tired and middle-aged. And here again official encouragement and support can be of the greatest assistance to local authorities. It is also quite clear that the external methods of treatment which form so large a part of the spa method actually reproduce in miniature many of the impressions of climate, and must be subject to the same laws. It cannot be doubted that both spas and climates in their great variety offer a wide choice and combination of powerful physical remedies, or that it is the task of the medical man to study and apply them over the wide range of incipient and chronic disease.

## A CENTURY OF MEDICAL BENEVOLENCE

A booklet commemorative of the centenary of the Royal Medical Benevolent Fund has been prepared by Sir Humphry Rolleston, and gives in a dozen pages the history of this charity. It is an uneventful history of consistent good work. The Fund's achievement can be very inadequately expressed in figures—some £400,000 distributed in the course of one hundred years to members of the profession and their widows and dependants who have fallen upon hard times. But the figures only tell the less important half of the story; the more important half is the sympathy and delicacy with which the Fund has always been administered and the personal service which it has enlisted in its cause. The history dates back to the Manchester meeting of the Provincial Medical and Surgical Association (now the British Medical Association) in 1836. The Fund may be regarded as the offspring of the Association, because it grew out of an earlier Benevolent Committee; also as its godchild, for it took the name of its parent and became at first the Provincial Medical and Surgical Benevolent Society and afterwards the British Medical Benevolent Fund; the prefix "Royal" was added to its title, by grant of the late King, in 1912. During its century of existence it has had only eight presidents. The first was John Baron of Cheltenham, a friend of Jenner; the second was Sir James Clark, the Court physician; and after him came Sir George Burrows, with the "record" period of sixteen years in the presidential chair, and then Sir James Paget, Sir William Broadbent, Sir John Tweedy (in the era of whose presidency, and under the inspiration of Lady Tweedy, the Ladies' Guild was established), and Dr. Samuel West. The present president, Sir Thomas Barlow, has exactly equalled the tenure of Sir George Burrows, and long may he continue! Sir Humphry Rolleston mentions some other names which must be held in grateful recollection. These include Dr. William Newnham of Farnham, for many years secretary and treasurer, and so closely identified with the enterprise that for a time it was spoken of as "Newnham's Fund"; also Cornelius Jonson, who was closely associated with the administration for forty years, and more recently Dr. Newton Pitt and Sir

Charters Symonds, who both served for fifteen years, the one as honorary secretary and the other as honorary treasurer. With the booklet there goes out an appeal in the name of the president for more annual subscriptions and for donations to the centenary fund, for an income of £11,000 in subscriptions and donations is neither commensurate with the need nor fully representative of the feeling of the profession for its less fortunate members. The address of the Fund is 11, Chandos Street, Cavendish Square, W.1.

The President and Council of the Royal Society of Medicine held a reception on Wednesday of this week to celebrate the centenary of the Fund. The guests invited were the members of the Association of the Royal Medical Benevolent Fund, thus including the vice-presidents, honorary local secretaries and members of committee, as well as a number of subscribers. It is hoped that the reception, so generously given by the Royal Society of Medicine, will be the means of acknowledging the Committee's gratitude to the large number of voluntary helpers and be, as well, an expression of thanks to all who have generously supported this work of charity. The President of the Fund announced that the sum received in response to the centenary appeal was approximately £2,943, but that he hoped much more would come in before the end of the year.

## CHEMICAL ATTACK ON STREPTOCOCCAL SEPTICAEMIA

It will be recalled that in October last year Professor Hörlein of Elberfeld addressed a meeting in London on the subject of "prontosil," a dye compound which had been found consistently to avert the effects of inoculating mice with streptococci, and to influence favourably the course of acute streptococcal infections in man. It could be administered either by subcutaneous injection or by the mouth, and its mode of action was unknown: since it was only weakly bactericidal, some indirect effect was postulated. The only experimental studies of this drug which up to that time had been made in England had supplied much less convincing results, and other workers abroad, including Levaditi and Vaisman, whose findings we noted a short time ago,[1] were unable to confirm the 100 per cent. cure in mice claimed by the original German observers. Nevertheless all were agreed that a significant effect was produced, whether in the form of actual recoveries or in prolongation of life, and the varied nature of the results illustrates only the difficulty of standardizing conditions in experimental bacterial infections and of so regulating them as to test fairly a remedy that may tip the scale in the patient's favour in the closely matched struggle of an acute bacterial infection in man. Novel and impressive as these early findings were, the tendency of new remedies to diminish in value on closer acquaintance is well known, and it is therefore highly significant that English investigators are now able to report favourably on a basis of much extended work. Colebrook and Kenny[2] have confirmed the curative action in experimental mouse infection, though still with the qualification that this effect is not invariable and that it depends a good deal on the strain of streptococcus used. They have also carried out a number of experiments with the serum or whole blood of treated patients and animals which fail to demonstrate any *in vitro* effect on streptococci such as might account for the therapeutic action of prontosil; its modus operandi is therefore as much a mystery as before. Finally, they report fully a series of thirty-eight cases of severe puerperal streptococcal infections treated with it, in which the results are carefully analysed and distinctly favourable. A companion paper by Buttle, Gray, and Stephenson,[3] is concerned only with laboratory studies, but appears to carry this discovery a stage further in that another related substance, *p*-aminobenzenesulphonamide, has been found to possess a curative action in mice equal to that of prontosil itself, and its lower degree of toxicity enables larger doses to be given. Hitherto everyone has been agreed that the action of prontosil is limited to infections due to *Streptococcus pyogenes*, and in this series of experiments it was tried in infections by staphylococci and pneumococci, and in trypanosomiasis and malaria, with completely negative results; but some indication was obtained that it may influence a meningococcal infection. All these observations point to the need for an extended therapeutic trial. Fortunately administration is simple, a system of dosage has been worked out, and undesirable effects are not to be feared, except that renal inefficiency may be a contraindication and a temporary sulphaemoglobinaemia may result. It is particularly desirable that experience should be gained in acute streptococcal infections other than puerperal fever. In one of Colebrook and Kenny's cases it is observed that the focus of infection was a septic thrombophlebitis which no remedy would be expected to reach. It is apt to be overlooked that the morbid anatomy of streptococcal infection is very variable, and that even in septicaemia account has to be taken not only of the bacteria in the blood but of those in the focus from which the blood was invaded. This treatment may depend for the full measure of its success on considerations such as these.

## INTESTINAL STRANGULATION

From investigations[4] into the cause of death following intestinal strangulation Mr. G. C. Knight and Dr. D. Slome, working in the research laboratories of the Royal College of Surgeons of England, conclude that within the strangulated loop toxic substances form which, when released into the blood stream, cause a permanent fall in blood pressure. They have shown that these depressor substances are present in the tissues of the gut wall within an hour of the onset of strangulation and in sufficient amounts to produce physiological effects when the blood from the strangulated loop is injected into another animal. At the end of a period of some hours after strangulation has begun the depressor substances leak through the peritoneal coat of the intestine into the peritoneal cavity, from which they are absorbed to produce the clinical picture of strangulation. Knight and Slome's experiments suggest that the loss of fluid into the strangulated loop is not sufficient to explain the clinical findings even when large masses of intestine are strangulated, and they therefore regard

[1] *British Medical Journal*, March 21st, 1936, p. 590.
[2] *Lancet*, June 6th, 1936, p. 1279.
[3] *Lancet*, June 6th, 1936, p. 1286.
[4] *Brit. Journ. Surg.*, 1936, xxiii, 820.

local fluid loss as being but of secondary importance in the production of the clinical picture. Their findings, which are based on an extensive series of experiments, raise the important question of the proper treatment of strangulated gut when the condition has persisted for many hours. In the early stages of strangulation the amount of depressor substance in the loop is not great enough to produce a lethal effect. Hence the present method of treatment—that is, release of the strangulating band and return of the intestine to the general peritoneal cavity—would appear to be adequate. At the other extreme, when the gut loop has become gangrenous, the treatment is also perfectly clear, resection and anastomosis either in one or in two stages being called for. In the intermediate forms of strangulation, when the loop is still viable according to the recognized criteria, relief of the strangulation in experimental animals has been followed in some instances by circulatory collapse and death—presumably from the release into the blood stream, via the veins and lymphatics, of a large quantity of depressor substance. This result suggests that in man, if the patient is in a bad condition, the local method of treatment should be resection of the strangulated loop with anastomosis, either immediate or delayed. The authors have not yet investigated the chemical nature of the toxic substances, but their preliminary results indicate that among them are to be found not only histamine but also substances which have so far been unrecognized. The problem of the origin of the toxins is discussed briefly, and it is suggested that bacterial action may not be sufficient to account for their presence, and that they may be formed under anaerobic conditions in the muscles of the intestinal wall. We look forward to further papers by these workers to give the surgeon some positive information as to the proper means of attack on the very high mortality which, in spite of modern surgery, is still associated with strangulation of the intestine.

## THE OESOPHAGUS IN HEART DISEASE

The right and left borders of the heart and some portions of the thoracic aorta are clearly visible against the radio-transparent lung tissue on *x*-ray examination, but the back of the heart and other relations of the aorta cannot be so well defined. When, however, the oesophagus is filled with barium suspension it is possible to infer pathological changes in these structures by their effect on the course and shape of the oesophagus. Dr. William Evans[1] has investigated the normal and abnormal course of this organ. Not wishing to rely solely on current anatomical descriptions of the relations of the thoracic oesophagus, he first studied these on the cadaver both by dissection and by radiography, and afterwards the normal *x*-ray appearance was determined in healthy subjects. The latter showed some variation in the course of the oesophagus, but as a rule four structures leave their mark on it—the aortic arch, left bronchus, left auricle, and descending aorta. Dr. Evans has sought to establish, and it would appear with success, that it is really the left bronchus that impinges on the oesophagus and not the pulmonary artery, which is close by. These various impressions are altered in disease, and are valuable in early diagnosis or in confirming clinical symptoms. The fallacies in some of the older methods of measuring the diameter of the aorta are pointed out, and the conditions under which this may be done accurately with the aid of the aortic arch impression on the oesophagus are determined. The cardio-vascular lesions that affect the other three impressions are dealt with individually. Good radiographs, fully illustrating the normal appearances and a variety of abnormal conditions, are reproduced. Dr. Evans's paper gives added precision to our knowledge, both anatomical and radiographic, of the oesophagus in relation to the heart and aorta, and in particular in the normal subject.

[1] Medical Research Council, Special Report Series, No. 208. London, 1936.

## EPIDEMIOLOGY OF DRUG ADDICTION

In the May issue of the *Bulletin of Hygiene* Dr. E. W. Adams gives an instructive survey of the prevalence in the various countries of drug addiction and its incidence in relation to sex, age, and social status. In the United States the addicts number between 100,000 and 120,000 according to various estimates. In Canada there has recently been an increasing use of codeine and of mariahuana, or cannabis indica, which has been introduced from the States, so that Sharman's estimate in 1929 of about 8,000 addicts has probably been greatly exceeded. Apart from Mexico, where mariahuana is the commonest form of addiction, no information is given concerning drug addiction in South America. In Great Britain only about 250 addicts are known to exist from official records, though allowance must be made for undetected cases. In France drug addiction is rare except among certain groups, such as artists, demi-mondaines, and the like. In Spain addiction is prevalent in certain districts, especially in Madrid, where illicit dealings with morphine and cocaine give trouble to the authorities. In Germany drug addiction greatly increased in the decade following the war, when, according to Wolff's estimate in 1933, there were between 4,000 and 6,000 addicts. Both in Switzerland and in Soviet Russia alcoholism is the real problem, and the incidence of drug addiction is negligible by comparison. In Egypt, thanks to the energy of the Egyptian Central Narcotics Intelligence Bureau under the direction of Russell Pasha, the number of addicts has fallen from half a million in a total population of 14 millions in 1930 to 18,673 in 1934. In India opium addiction is not so prevalent as is generally supposed, but cocainism and morphinism are on the increase. In China there has been of late an increased consumption of morphine, heroin, and cocaine, and there are 597 hospitals for treatment of drug addicts. As regards incidence in relation to sex, age, and social status, the most important data came from the United States. Of 1,600 addicts studied by experts of the U.S. Public Health Service, the ratio of males to females was 6 to 1, and in 60 per cent. of the patients addiction was established between the ages of 20 and 34; although some of the addicts were of good social standing and engaged in lawful occupations, the overwhelming majority belong to the underworld. In Europe Dr. Adams states that there is a surprising lack of systematized information regarding the social

incidence of addiction. In Germany, from which the most useful information is obtained, the proportion of medical practitioners among addicts is high, and the drug habit among the working-class population has increased considerably since the war. In Rumania, where addiction is not common, the habit in most cases had been contracted from incautious medical treatment for various ailments. In Great Britain cases seem to be proportionally more frequent in the great urban centres than elsewhere, and among persons engaged in occupations which entail much mental and nervous strain, as well as in those whose occupation gives them special facilities for access to drugs. In Egypt, in addition to the high proportion of cases between 20 and 30 (64 per cent.), before the war drug addiction in the form of hashish or opium smoking was mainly confined to the middle and lower classes, but during and after the war drug abuse has spread among the rich, where the use of morphine and heroin has replaced the smoking or eating of opium and hashish. In conclusion, Dr. Adams emphasizes the comparative youthfulness of the general mass of the addict population in all the countries mentioned and the far greater prevalence of addiction among men than among women.

## A PIONEER MEDICAL WOMAN

Elizabeth Garrett Anderson is a unique figure in the medical history of England, inasmuch as her life covered the whole period of the initiation, continuation, and successful completion of the demand for right of entry of women into the medical profession on equal terms with men in Great Britain and Ireland. Miss Elizabeth Garrett was not the first English woman to obtain a medical degree, Miss Elizabeth Blackwell of Bristol having graduated M.D. of a small American university in 1849, but she was the first to take a diploma in England. The story of Miss Garrett's successful attack on the male monopoly of medicine, and of the pioneer work she did with Miss Sophia Jex-Blake and others, was told in these columns after her death in December, 1917. The struggle for admission of women practitioners to membership of the British Medical Association ran on very similar lines to that for the right of entry to the profession. Here again Dr. Garrett Anderson was a pioneer in the movement. Her honourable connexion with the Association culminated in election in 1897 as president of the East Anglian Branch, and three years afterwards she was vice-president of the Section of Medicine at the Annual Meeting of the Association at Ipswich. On June 9th, 1936, the centenary of her birth was celebrated at the Women's Hospital in Euston Road, London, which bears her name. Lady Robertson, who presided, said that this was a proud day for all connected with the hospital; and, welcoming the children of the founder, Sir Alan Anderson and Dr. Louisa Garrett Anderson, she recalled the happy circumstance that this was Sir Alan and Lady Anderson's wedding day. Lady Barrett, president of the London School of Medicine for Women, paid a fine tribute to the memory of a great woman. Elizabeth Garrett Anderson, she said, was a pioneer who refused to be daunted by obstacles. Her courage and tenacity and far-reaching practical vision opened doors for medical women to take up hospital practice and post-graduate study, and for women patients to be treated for all diseases by women doctors. But for her creative work for the School of Medicine this institution which she founded could not have come into being. Her influence was deeply impressed upon the life of women to-day. Sir Alan Anderson recalled how his father and mother first met in the 'sixties and began that happy partnership in a great idea which had changed the outlook of women and the outlook upon women. Something much wider than medicine, he said, must have been in the mind of Elizabeth Garrett when starting the campaign. His final word to the friends of the hospital was an exhortation to maintain the quality of its work. Four generations of the family were photographed after the luncheon. The group was made up of her son, her grandson Mr. Donald Anderson, and her great-granddaughter Gillian. Her own portrait by Sargent was the fourth figure in the picture.

## HARVEY: DE GENERATIONE

Dr. Arthur William Meyer, who is professor of anatomy in the Stanford University, California, has done a useful piece of work by analysing the *De Generatione Animalium*,[1] which was published by Dr. William Harvey at the entreaty of Sir George Ent in 1651. Professor Meyer has prepared himself for the task by reading critically the various translations and then studying what has been said about the essay by the few Harveian Orators who have thought it worth while to mention it. Like other readers, he finds difficulty in explaining the difference between the *De Motu* and the *De Generatione*. The real explanation probably lies in the fact that Harvey had been collecting his material for many years before Ent took his manuscript and had it printed. By that time Harvey was too old to subject it to the drastic editing which would have brought it up to the standard of his treatise on the movement of the blood. Ent for his part was submitting the proofs to the author and was unwilling to make any drastic changes or abridgement, for even in old age Harvey retained the fiery temper which characterized his family for several generations. Professor Meyer dedicates his book to Professor W. Snow Miller, who is well known for his zeal in connexion with the history of medicine. He gives a full bibliography and a good index. There are eleven illustrations, chiefly showing the title-pages of the different editions. The least satisfactory is that of Faithorne's bust of Harvey, which has been taken from a worn plate and has thus lost much of the character which is so marked a feature of the earlier pulls.

[1] *An Analysis of the De Generatione Animalium of William Harvey*. By Arthur William Meyer. California: Stanford University Press; London: H. Milford, Oxford University Press. (13s. 6d.)

The annual dinner of the Cambridge Graduates' Medical Club will be held at King's College, Cambridge, on Friday, June 26th, at 7.30 p.m., with Mr. W. H. C. Romanis, vice-president, in the chair; price of dinner (including wine), 12s. 6d. Members intending to be present are asked to inform one of the honorary secretaries, Dr. F. G. Chandler, 1, Park Square West, W.1, or Mr. W. D. Doherty, 10, Upper Wimpole Street, W.1. The annual meeting will precede the dinner at 7.15.

# TREATMENT IN GENERAL PRACTICE

*This article is one of a series on the management of some of the rheumatic diseases met with in general practice.*

## TREATMENT OF FIBROSITIS

BY

W. S. C. COPEMAN, M.A., M.D., M.R.C.P.

Fibrositis is a general term for a condition of pain, stiffness, and limitation of movement which may occur almost anywhere in the body. It may be defined as being a condition in which inflammatory changes involve the subcutaneous tissues, the superficial or deep fascia of the body, the muscle sheaths and tendons, the fibrous portions of the joint capsules and ligaments, the bursae, or the fibrous sheaths of the larger nerves. It may therefore be subdivided into three types according to the nature of the structures primarily attacked:

1. Panniculitis: inflammation of the subcutaneous tissues and fat.
2. Myositis: inflammation of the superficial and deep fascia and muscle sheaths and tendons.
3. Neuritis: inflammation affecting primarily the fibrous sheaths of nerves.

The clinical manifestations vary according to the area of the body and the type of fibrous tissue involved. The predominant effect, for instance, of involvement of the muscles of the neck will often be headache ; of those of the limbs, numbness and tingling ; and of the fibrous tissue surrounding joints, stiffness and pain on moving these joints, which is often wrongly attributed to true arthritis. The local effect of such inflammation upon the affected muscles will be to keep them in a state of spasm during the acute period. Subsequently the spasm will relax, but localized patches of nodular induration will be felt lying in the muscles. Occasionally, also, thin fibrous cords will be felt running through the subcutaneous tissues. These " nodules " will generally, but not invariably, prove tender on palpation.

The victims of fibrositis will usually be found to have some degree of defective skin circulation, as evidenced by abnormal sensitivity to cold weather or to local draughts, spontaneous bruising, or the fact that they perspire in the hottest weather only with difficulty. Attacks of fibrositis will occur in many people without apparent detriment to their general health, and in such persons the suspicion must arise that the cause may not be primarily an infective one.

### Foci of Infection

The general principle to be adopted in the presence of any case in which the symptoms do not call for urgent treatment will be an endeavour to establish the aetiology of the attacks.

A large group of cases can be traced to the presence of focal infection, and both the teeth and the tonsils are generally suspect. This is perhaps more particularly so in cases in which the upper part of the body or the arms are chiefly affected. It must be remembered in this connexion that negative *x*-ray evidence of apical infection of the teeth must never be accepted as conclusive evidence that this does not exist, since changes which can be demonstrated by this means are necessarily of a chronic and advanced nature. Occasionally an abdominal focus of infection will be found, although with regard to the bacteriology of the faeces Pemberton's aphorism must be borne in mind when the question of vaccine treatment is considered—" It is a poor bowel which doesn't grow something." Another focus of infection, which is sometimes overlooked, is the prostate, and in the absence of other infection it is worth while to perform prostatic massage and culture the " bead " so obtained.

A further group of cases would appear not to be of a primarily infective nature but to be allied to gout or to a special sensitivity to certain types of food. Such cases may be suspected by their excellent general health even during attacks, the periodic or seasonal nature of their attacks, a history of familial gout or of being " unable to digest " certain foods or drinks, and finally by the fact that their fibrositis tends to prefer the lower limbs and portions of the body. Such patients, in addition, often show the symptom-complex described by the French as " hépatisme." This is shown principally by a morning headache, furred tongue, and a tendency to incomplete bowel emptying with light-coloured and offensive stools ; often, too, there is slight tenderness on palpation in the neighbourhood of the liver. For this group of patients the treatment will be on the usual lines for gout, with special attention to the bowels and elimination of any food to which the patient can be shown to be sensitive.

Finally, a certain proportion of cases of fibrositis can be traced to chronic strain often secondary to faulty posture. A common example of this will be found in those cases in which the fascia lata of the thigh is tender and painful in conjunction with a flattened plantar arch. Such patients are usually cured when the distribution of the body weight is readjusted by raising the inner edges of the shoes. Some cases of low backache seem also to be attributable to the same cause.

The specific treatment of the condition of fibrositis will fall into several categories, success being generally the resultant of a wise selection of remedies, according to the type of case, rather than the vigorous application of one remedy only.

### Drug Therapy

In the acute stage rest in bed is desirable, and internally analgesic measures are primarily indicated. Aspirin or calcium acetylsalicylate (5 to 15 grains) are the most efficient drugs for this purpose in the majority of cases. If necessary potassium iodide (2 to 5 grains) may be added, as may phenacetin (5 to 10 grains) or caffeine (5 grains) at four-hourly intervals.

A useful proprietary product which in addition to aspirin and phenacetin contains codeine phosphate 1/6 grain is tab. veganin. Alternatively, Dover's powder (5 to 15 grains) may be combined with aspirin, but is rather constipating. Pyramidon (3 to 10 grains), which may conveniently be given in the form of novalgin, is a centrally acting drug, and will sometimes be effective where the salicylate group fails. Externally an ointment designed to act either as a rubefacient or as a counter-irritant should also be ordered. Ung. methyl salicyl. smells rather strongly but is efficient, whilst in the form of Bengué's balsam capsicum is added. A hot linseed poultice containing opium will often give considerable relief if applied every few hours, as may a hot cloth wrung out in a

solution of ordinary mustard in water. Massage is undesirable in the acute stage.

In addition to analgesic drugs a mercurial purgative such as calomel (1/2 to 2 grains) should be given at the outset of the attack and followed next morning by a strong dose of Epsom or Glauber salts in hot water. In certain cases benefit will result from a short course of colonic lavage twice a week for two to three weeks. Where it is desired to immobilize the muscles of the back during the acute stage, the most usual effective method is by means of a perforated belladonna plaster. This must, however, always cross the mid-line behind and come round to the front in order to achieve a maximum effect. Ordinary wide strapping plaster is quite a good substitute, but elastoplast is not so suitable except in the case of the shoulder.

### Heat and Massage

When the condition is less acute and the patient is able to get up, the application of both heat and massage to the affected regions is indicated. Heat may be applied in a dry or a moist form ; the one often succeeding where the other has failed. Dry heat may be given by means of a portable lamp, an electric heating pad, exposure to a gas-fire (which gives out infra-red rays), the application of a hot iron through brown paper applied to the skin, a hot-water bottle, or a bag of salt or sand which has been heated thoroughly in the oven.

Moist heat may be applied as kaolin, bread, or linseed poultices, which are possibly more efficacious although less easy to prepare than antiphlogistine ; mud packs such as can be prepared from the dried cubes of foreign spa mud, which can now be bought with full instructions ; applications of hot paraffin wax of a special melting-point, which is sold for this purpose ; or, if the patient is in a condition to do so, as a general sweating exposure in a Turkish bath. If the latter be ordered, however, the patient should be instructed to drink fluids copiously before, during, and after his treatment, as otherwise the temporary concentration of the blood is likely to provoke a further acute attack. Finally, perhaps the simplest method is to order an ordinary bath to which 4 lb. of Epsom salts (or common salt) have been added. This should be taken as hot as possible, and, contrary to the general belief, the patient should not " soak in it " but should get out after only five to ten minutes' immersion. He should then be briskly rubbed down, some ointment being rubbed rapidly into the affected areas, and be wrapped in a blanket and put to bed for several hours. After this, if deep massage be available for the affected areas it will generally prove effective after a few treatments, although it is painful at first. For robust patients, a variation of considerable value will be the addition of " transkutan " to the thermal bath once or twice a week.

### Hydrotherapy and Counter-irritation

Where the patient lives near a spa or an institution equipped for hydrotherapy, " Vichy " douche massage followed by " contrast douching " (alternate hot and cold water directed on to the painful areas under pressure from a hose-pipe) is probably the best follow-up treatment, and stimulates the skin to resume its normal function.

In certain cases, more particularly when the complaint is of lumbago, counter-irritation will also prove of great value. This may be applied by heating an ordinary platinum loop, such as is used for bacteriological purposes, to a white heat by the bedside and applying it to the skin over the affected muscles in twelve to fourteen places. A small blister should result from each application, and the whole area may then be covered over with a gauze dressing. An electric cautery will do the same thing more efficiently. Another method is to produce blisters by means of " blistering fluid " or cantharides plasters, but these do not seem to be of equal value to the actual cautery. Dry-cupping is a somewhat obsolete method of treatment, but is occasionally effective, as is full exposure to a mercury vapour lamp at a distance of eighteen to twenty-four inches.

In the chronic phase massage is essential if the attack is to be terminated in the minimum time and if recurrence is to be avoided. To be effective, the indurated areas (nodules) must be carefully sought out in the muscles, and the massage must be very deep at these points. It will be found that after deep kneading with the finger-tips or thumbs they will, after an initial period when they may become increasingly painful, gradually become insensible to palpation, and ultimately disappear. This process will be considerably facilitated if it be preceded on each occasion by twenty to thirty minutes' application of heat in one of the forms mentioned above. In certain cases a " nodule " will prove to be too painful for this type of treatment, which will then induce protective spasm in the surrounding muscles, and so render further " kneading " impossible. In such cases a dose of aspirin or other analgesic may usefully be given prior to beginning the treatment.

Where one or more discrete nodules can be felt, and when the pain is found to be chiefly localized in these sites, the effect of injecting a few cubic centimetres of a local anaesthetic, such as novocain or " A.B.A." compound, into them is sometimes dramatic. This treatment is not, however, of much use in the presence of more diffuse pain or tenderness.

### Diet and After-care

In obese patients it is wise to prescribe a weight-reducing diet. The chief foods to avoid will be the starches and carbohydrates, from which they derive the majority of their calories. Bread, potatoes, and pastry can well be eliminated, and substituted by rye-vita, diabetic bread, or bran biscuits for a time. A day or two of complete starvation—except for fluids, which should be taken copiously—will, if submitted to by the patient at the outset of an attack, often cut it short. In obstinate cases the addition of a small regular dose of thyroid extract (1/4 to 1/2 grain) twice a day before meals will be of value.

In cases in which the origin is suspected to be gouty, one or two intramuscular injections of an ampoule of atophanyl at an interval of several days may be of help, while one of the hexamine preparations such as " piperazine," " urodinal," or " uralysol " (one teaspoonful in half a glass of water before breakfast) should be ordered in addition for some weeks.

Subsequent to an attack of fibrositis, it is important that the patient should be taught to contract the affected muscles daily by means of appropriate exercises. He should also make a point of obtaining some regular exercise in the open air, even at the cost of rising somewhat earlier in order to walk part of the way to the office. The obese subject must not be allowed to regain his lost weight once the attack recedes ; nor should the question of the localization of attacks, as the result of the occupation or hobbies of those predisposed to suffer, escape the notice of the medical attendant.

The prognosis in fibrositis is good if sufficient care be taken and if the value of external as well as internal remedies is remembered. An exception to this is, however, to be found in the case of very old patients, since the senile form of fibrositis will sometimes be found intractable to all the usual remedies.

# AN INVESTIGATION OF THE DIET OF SCHOOL CHILDREN

BY

A. ANDERSON, M.D., D.P.H.

MEDICAL OFFICER OF HEALTH, CHORLEY

In recent years increasing attention has been given to the diet of the nation. Nutrition surveys and other investigations have revealed the necessity of an adequate and balanced diet, and emphasis has been placed on the importance of first-class protein, vegetables, fruit, milk, vitamins, etc. Again, the economic depression has focused attention on the minimum quantity of food required and on the cost at which such food can be obtained.

The object of the present investigation was to ascertain the usual constituents of the diet of school children in an industrial town. No attempt at quantitative analysis has been made.

## Recording the Diets

All the children attending the upper departments of the elementary schools in Chorley were asked to write down what they had eaten for breakfast, dinner, tea, and supper on Tuesday, September 17th, and on Tuesday, December 10th, 1935. Each meal was recorded on a separate piece of paper, and neither the name of the child nor the school was given. The children were not informed of the reason for this request, and in an endeavour to remove any competitive element from the recording of meals the proposition was put to the children as a memory test. On the Tuesday afternoon they were asked to write down what they had had for breakfast and dinner on that day, and on the Wednesday morning they recorded what they had eaten for tea and supper on the previous day. Tuesday was chosen because it is a market day in the town, and because the diet on that day is subject to no sectarian influence. The disadvantage of obtaining records for one day only is recognized, but to secure them for a longer period would have entailed dealing with a selected group of children.

Chorley is a market town with a population at the 1931 census of 30,796, and it is surrounded by a considerable rural area. The chief industries are cotton spinning, weaving, bleaching, and finishing, motor manufacture and repairs, and laundries. A large proportion of female labour is employed. The average number of persons registered as unemployed in one week of each month during 1934 was 1,920 men, 1,070 women, and 166 juveniles, and during 1935 it was 1,914 men, 1,022 women, and 164 juveniles. The amount of out-relief disbursed to Chorley residents was £13,002 in 1934 and £16,862 in 1935.

## Classification of Items

Records of 9,698 meals were obtained in September and of 8,432 meals in December, the difference being due to the lower attendance of children in December. Forty-seven of the September records and fifty-two of the December ones were discarded as illegible or unintelligible. Where "nothing" or "none" was recorded that meal was excluded, and the total of meals available for analysis was as follows:

| | Breakfast | Dinner | Tea | Supper |
|---|---|---|---|---|
| September ... | 2,409 | 2,403 | 2,415 | 1,933 |
| December ... | 2,131 | 2,129 | 2,123 | 1,506 |

The headings under which the constituents of the meals have been classified have been made as simple as possible. Bread-and-butter, etc., includes bread and margarine and bread dipped or fried in fat. Milk, etc., includes ovaltine, malted milk, and such drinks as are usually made with milk. Cake, etc., includes biscuits and all forms of sweet cake, slab cake, or buns. Jam, etc., includes marmalade, honey, syrup, and treacle. Every effort has been made to classify the various items as accurately as possible—for example, meat sandwiches are classified as bread-and-butter and meat. Where any item shows a percentage frequency of less than 0,1 it has not been included in the table.

It will be seen that "tea" and "bread-and-butter" each form part of 70 per cent. of breakfasts; "tea and meat and potatoes" about 60 per cent. of dinners; and "tea and bread-and-butter" over 70 per cent. of teas. Many of the children have a light meal in the middle of the day and their chief meal is tea—the familiar high tea so common in industrial areas. Supper is a variable meal, but the consumption of a heavy meal before going to bed was recorded much more frequently than was anticipated.

*Percentage Frequency of Certain Items in the Diet of School Children*

| | Breakfast | | Dinner | | Tea | | Supper | | Total Meal | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Sept. | Dec. | Sept. | Dec. | Sept. | Dec. | Sept. | Dec. | Sept. | Dec. |
| Tea ... ... | 72.1 | 66.4 | 63.3 | 69.4 | 87.6 | 87.6 | 35.4 | 35.6 | 67.5 | 67.1 |
| Cocoa ... | 11.6 | 14.4 | 2.1 | 3.1 | 1.8 | 2.6 | 16.2 | 22.6 | 7.5 | 9.8 |
| Coffee ... | 6.5 | 7.8 | 2.8 | 3.6 | 1.1 | 1.6 | 3.7 | 4.8 | 3.5 | 4.4 |
| Milk etc. ... | 4.4 | 5.1 | 3.7 | 2.8 | 2.6 | 2.1 | 25.5 | 27.6 | 8.2 | 8.0 |
| Water ... | 0.7 | 0.7 | 6.6 | 5.6 | 0.9 | 1.1 | 6.6 | 5.6 | 3.5 | 3.1 |
| Mineral waters, etc. | — | — | 1.5 | 0.3 | — | 0.1 | 0.8 | 0.3 | 0.6 | 0.3 |
| Soup ... ... | — | — | 3.6 | 4.4 | 1.4 | 2.7 | 0.5 | 0.5 | 1.4 | 2.0 |
| Oxo, bovril, etc. | 0.3 | 0.3 | — | 0.1 | 0.2 | — | 0.7 | 1.0 | 0.3 | 0.3 |
| Bread (dry)... | 19.7 | 16.9 | 22.1 | 18.6 | 18.0 | 16.6 | 14.3 | 12.1 | 18.8 | 16.3 |
| Bread-and-butter, etc. | 72.1 | 73.1 | 41.9 | 43.2 | 73.3 | 72.6 | 37.5 | 34.2 | 57.2 | 57.5 |
| Cake, etc. ... | 18.2 | 15.9 | 20.0 | 21.7 | 41.1 | 41.7 | 30.4 | 31.9 | 27.3 | 27.4 |
| Jam, etc. ... | 26.0 | 20.5 | 4.6 | 3.6 | 17.2 | 13.1 | 13.9 | 11.1 | 15.5 | 12.2 |
| Egg ... ... | 27.9 | 23.4 | 7.8 | 6.0 | 4.9 | 5.6 | 0.5 | 0.1 | 10.8 | 9.5 |
| Meat and bacon | 22.1 | 21.4 | 59.5 | 57.1 | 25.0 | 31.5 | 3.8 | 4.0 | 28.8 | 30.5 |
| Fish ... ... | — | 0.1 | 3.5 | 2.9 | 10.5 | 9.6 | 1.8 | 0.7 | 4.1 | 3.6 |
| Potatoes ... | 0.2 | 0.4 | 68.9 | 69.5 | 33.1 | 38.3 | 13.6 | 10.9 | 30.0 | 31.2 |
| Vegetables, raw | — | — | 0.2 | 0.2 | 3.0 | 1.6 | — | — | 0.8 | 0.3 |
| ,, cooked | 0.8 | 0.2 | 20.5 | 17.7 | 6.9 | 7.0 | 1.5 | 1.3 | 7.7 | 7.0 |
| Cheese ... | 2.7 | 2.2 | 0.9 | 0.8 | 3.6 | 4.3 | 2.0 | 2.3 | 2.3 | 2.4 |
| Cereal ... | 15.0 | 15.7 | 0.5 | 0.6 | 0.6 | 0.3 | 5.6 | 4.7 | 5.4 | 5.7 |
| Fruit and tomatoes | 13.0 | 7.4 | 12.9 | 8.7 | 30.9 | 12.7 | 3.8 | 1.7 | 15.8 | 8.0 |
| Pudding ... | — | — | 8.2 | 8.0 | 1.6 | 1.7 | — | 0.2 | 2.6 | 2.7 |
| Milk pudding | — | — | 9.6 | 8.0 | — | 0.7 | — | — | 2.5 | 2.4 |

## Some Deficiencies of the Diets

A study of the table shows that milk, soup, eggs, fish, cheese, fruit, vegetables, and pudding do not appear in the diet as frequently as is desirable. Even if allowance is made for milk which is consumed in varying quantity with tea, coffee, cocoa, and cereals the position is far from satisfactory. It is well known that children whose diet is inadequate or unsuitable may show no signs of malnutrition. During 1935 I examined at routine medical inspection 1,280 children in the upper departments of the elementary schools and classified them on a nutritional basis as "excellent" 19.3 per cent., "normal" 68.2 per cent., "slightly subnormal" 12.3 per cent., and "bad" 0.2 per cent.

A study of the individual records showed little evidence of home cooking. This was emphasized by the frequency with which the children recorded that certain foods were "home-made" or "shop." In 200 consecutive meals in which potatoes were recorded the children described them as follows: chips 105, chips (home-made) 10, chips (shop) 62, and potatoes 23. Meat occurred with distressing frequency as meat pie, pork pie, meat and potato pie, corned beef, etc. Fruit usually appeared as tinned fruit,

or in pies or tarts. Cake or biscuits was the usual substitute for pudding. Personal observation between the hours of noon and 1 p.m. of shops selling prepared foods has confirmed this. Apart from fish-and-chip shops there are fifty-four premises in the town registered for the manufacture and sale of potted or preserved meat, etc.

In comparing the September and December dietaries there is little significant difference except in regard to fruit and jam, which occur less frequently in December. Little advantage seems to be taken of the abundance of vegetables available in September. On the whole the December dietary appears to less advantage than the September dietary. Further, 24.6 per cent. of the children recorded "no supper" in December as compared with 19.9 per cent. in September. Another matter not shown in the table is that in December the milk-in-schools scheme was in abeyance, whereas in September 1,012 of these children were consuming an additional third of a pint of milk.

Obviously many fallacies can exist in this type of inquiry. The most important is connected with the accuracy of the children's replies. It is highly probable, however, that omissions were few, as many of the records were given in great detail, and included such items as liver salts, medicine, tonic, and malt and oil.

### Summary

1. A tabulation has been made of the items of 9,160 meals consumed by school children on Sepember 17th, and of 7,889 meals consumed on December 10th, 1935.

2. The percentage frequency with which various foods occur in these meals has been recorded.

3. The diet appears to be deficient in milk, soup, eggs, fish, cheese, fruit, vegetables, and puddings.

4. Only a small proportion of the children show clinical evidence of subnormal nutrition.

5. Evidence is produced to show that cooking in the home is not practised to any great extent.

6. The dietary in December is less satisfactory than in September.

I wish to express my thanks to the Secretary of Education and the heads of the upper departments in the elementary schools by whose co-operation and assistance this investigation was rendered possible.

## SAFETY ON THE ROAD

### LIGHTS, KERBS, AND CROSSINGS

The regulations issued by the Ministry of Transport regarding the head- and side-lights of motor cars, which will come into force this autumn, will be welcomed by medical practitioners and others who are required to drive at all hours and in all weathers. Those limiting the power of the light of side-lamps and requiring that there should be suitable provision for the prevention of glare from head-lamps are eminently reasonable. They are also practicable; indeed there are but few cars on the road that do not now conform to these rules. The chief offenders against the one regarding side-lights are certain trade cars and some luxury cars. On some vans and taxicabs, and on a few big cars, the side-lamps are fixed to the dash, just at the level of the eyes of the pedestrian and the car driver. The improvements in batteries and lamps have resulted in increased lighting power until the side-lamps are little less effective than head-lamps. Almost the only cars that offend against the head-lamp rules are those with fixed lamps. Yet these can easily be made to conform to the rule by slightly shifting the near-side head-lamp so that its rays are projected a little to the left and downwards, and inserting a hand switch in the wire of the offside head-lamp.

Readers will remember the claims put forward by certain vendors of yellow glass, and the experimental observations published thereon in our columns (*British Medical Journal*, January 26th, 1935, p. 168). More recently startling claims for the advantages of yellow light for all driving purposes have come from a Paris committee. The British Minister of Transport referred that report to the British Medical Association, which appointed a special committee under the chairmanship of Sir Joseph Barcroft, professor of physiology in the University of Cambridge. This committee concluded that the Paris committee had made extravagant claims for the superiority of yellow lights over the ordinary "white" variety. (*Supplement*, April 25th, p. 225.)

Visibility through fog in daylight is beyond human control, but we have recently seen a fog lamp that bids fair to be of real use at night. The new lamp (Lucas's "passlight" or fog lamp) uses a brilliant white light, but this is projected in a special way. It has been known for many years that if a hood were placed over a lamp so as to prevent the light rays rising upwards one could see over the projected beam such objects as were in the line of the beam. In this new lamp the bulb has a close-fitting hood covering the upper and front part. The rays are projected forwards by two reflectors: the upper, filling half the case, is just the half of the usual parabolic reflector, with its focus behind the lamp so that it throws its rays forwards and downwards; the lower is the half of the other, but is tilted and pushed forwards "out of focus," so that it also projects the light forwards and downwards. The result is a remarkable beam of light, fan-shaped, with an upper horizontal edge, thus ⊃. A demonstration with muslin curtains was most convincing. At the far end of a windowless passage was fixed the rear wheel of a bicycle with its white mudguard and red reflector shining in the rays of the ceiling light. Two parallel curtains a foot apart were drawn, and the view was lost. A yellow "fog lamp" was switched on, but only served to make the curtains yellow. When only the new lamp was switched on the curtains were bright below and dark above, and through that unlighted part one could see clearly the bicycle wheel and reflector shining in the lower beam of light. Practical usage of the lamp proves that it has real advantages.

Recent observations of the Ministry of Transport that the majority of road accidents occur on straight roads and with good visibility suggest that it is the apparent ease of driving in good conditions that leads to lack of care or to the taking of risks, and there is some reason to think that the speed at which crossings are approached is responsible for a high proportion of accidents. Too often the existence of the crossing is unknown or unseen till too late. One of the best means of indicating the presence of crossings (other than signals) is that adopted in the area of Mitcham, in South London, where a length of kerbing about thirty feet at each corner of a crossing is whitened. These white lines are visible for long distances, and much more readily than lines in the middle of the road, or beacons, or studs—indeed, studs set across the road are puerile. A writer in the *New Statesman and Nation* has suggested lately that all kerbs should be whitened and new roads edged with white concrete. This plan can be seen carried out on the road to Eastbourne through Ashdown Forest. But while lines are an excellent guide in the dark, in the day time the gaps in the continuous white line are not so conspicuous and emphatic a warning as are the occasional white kerbs at the crossings.

# Nova et Vetera

## THOMAS WILKINSON KING

### "THE FATHER OF ENDOCRINOLOGY"

In the centenary number of the *Guy's Hospital Reports*[1] Sir William Hale-White, who has piously provided many sketches of his predecessors and other "Great Doctors of the Nineteenth Century," rescues from undeserved oblivion the somewhat lonely and pathetic figure of Thomas Wilkinson King, who, like Thomas Hodgkin, was pathologist at Guy's Hospital a century ago, but never got on to the staff of the hospital. Otherwise these two men differed: Hodgkin's name, though he failed to be elected to the physicians' side of the staff, has been kept green by the loyalty of Samuel Wilks, and he lived until 1866 to die of dysentery at Jaffa; whereas King, his pupil and successor, died in 1847, at the age of 36, of pulmonary tuberculosis in Bedford Square, and was a prospective surgeon, who, like Henry Gray of St. George's Hospital, also curator of the museum, was struck down prematurely.

Sir William Hale-White describes King as "the father of endocrinology," for he definitely recognized that the thyroid had an internal secretion in 1836, or nineteen years before Claude Bernard first used the term "internal secretion" for the transformation of glycogen into sugar by the liver. King made elaborate investigations on the heart, and has previously been mainly known as the describer of the moderator band in the right ventricle and of the safety-valve function of the right ventricle, the latter, however, not receiving any support from modern cardiology. Flattening of the left bronchus by a dilated left auricle, as in mitral stenosis, the post-mortem nature of digestion of the stomach and lower part of the oesophagus, milk spots on the surface of the pericardium, and that disease of the cardiac valves usually begins where the valves come in contact with each other, were other observations made by him. Further, he insisted that ageing of the tissues played an important part in determining the course of disease in the old.

## THE MURDER OF THE PRINCES

### PROFESSOR WRIGHT'S IDENTIFICATION

In his Cavendish Lecture delivered before the West London Medico-Chirurgical Society on June 4th Professor William Wright interested an overflowing audience at Kensington Town Hall with his description of the bones of the young princes who were murdered in the Tower. Richard III had some admirable qualities, but he is hardly the sort of monarch around whom one would expect a cult to gather more than four centuries after his death. Such a cult has gathered, however, and an attempt has been made to cleanse the memory of Richard of this act of blood-guiltiness, and to suggest that the assassination did not take place until the reign of Henry VII. It is a narrow issue, for it turns upon whether the princes died in 1483 or after Henry's accession only two years later.

In 1933 the urn in Westminster Abbey which contains the remains of young Edward V and his brother Richard of York was opened, and Professor Wright was appointed, on the nomination of Lord Moynihan, to make the examination. The most cursory examination of the bones showed that the princes were under the age of 18, for the elements forming the sockets of the shoulder and hip showed no signs of union. But fortunately the bones most critical in the determination of age had been preserved. The second cervical vertebra or axis bone of the older boy was without the apical part of its odontoid process, and on this fact Professor Wright asserts that it must have belonged to a child of under 13. The ages of the princes, therefore, were respectively under 13 and about 10, instead of 14 and 12 as the apologists for Richard would have us believe. Professor Wright showed in parallel photographs the humerus, the ulna, and the femur of the brothers, indicating how the difference in length of the bones corresponded to the difference of two years between their ages. In the older boy the second premolar was missing on both sides, and there was evidence that a tooth in the same vertical plane was missing in the younger, suggesting a familial connexion. This was also suggested by the presence of Wormian bones of unusual size and almost identical shape in the lambdoid sutures of both craniums. From an examination of the dental sockets Professor Wright deduced that Edward V must have suffered considerable pain and discomfort from dental sepsis. In an endeavour to reconstruct the appearance of the two youths, he said that on the evidence of the bones they were thin and slender, the elder 4 feet 10 inches in height, and the younger 4 feet 6½ inches. One telling piece of evidence as to their fate was a distinct brownish stain, which in his view could have been caused by nothing but blood, on the face bones of the young king.

After the examination the bones of each of the brothers were carefully wrapped in lawn and returned to the urn, with an inscription on vellum indicating what had been done, signed by the Dean and other Abbey officials and by Professor Wright. The bones when the urn was opened were found mixed with a large number of animal bones, no doubt due to the fact that the place of their interment in the Tower was near the banqueting hall, and when the remains were transferred to Westminster Abbey in the time of Charles II no one was careful or knowledgeable enough to separate them. The animal bones, of course, were not returned to the urn, and Professor Wright said that he left the Abbey with the satisfaction that he had not only identified the bones of these children, but had purified their tomb.

[1] *Guy's Hospital Reports*. Centenary Number, 1836–1936. Edited by A. F. Hurst, M.D., and R. C. Brock, M.S. London. 1936. Vol. lxxxvi, Nos. 1 and 2.

## FOTHERGILL TESTIMONIAL FUND

### SIXTH LIST OF SUBSCRIBERS

The following is the sixth list of subscriptions to the testimonial to Dr. Rowland Fothergill received in response to the letter published in our columns of January 18th (p. 130).

In accordance with the decision announced in the previous list of subscribers, the Fund has now been closed.

| | £ | s. | d. |
|---|---|---|---|
| Amount previously acknowledged ... ... | 1,466 | 17 | 0 |
| Wiltshire Panel Committee ... ... ... | 25 | 0 | 0 |
| S. D. Bhabba (London) ... ... ... | 1 | 0 | 0 |
| Reading Panel Committee ... ... ... | 5 | 5 | 0 |
| Stoke-on-Trent Panel Committee ... ... | 10 | 10 | 0 |
| H. C. Bristowe (Bristol) ... ... ... | 1 | 1 | 0 |
| Wakefield Panel Committee ... ... ... | 1 | 11 | 6 |
| Newport Local Medical and Panel Committee ... ... ... ... ... ... | 2 | 2 | 0 |
| H. Newsome (nr. Bristol) ... ... ... | | 5 | 0 |
| N. Flower (Yeovil) ... ... ... ... | | 10 | 6 |
| R. St. J. Kemm (Cheddar) ... ... ... | | 10 | 0 |
| Drs. Cameron, Collins, and Pearce (Taunton) | 1 | 1 | 0 |
| J. Evans (Knowle) ... ... ... ... | | 5 | 0 |
| E. B. Hinde (Norwich) ... ... ... ... | 1 | 1 | 0 |
| Annie Hyatt (Shepton Mallet)... ... ... | | 5 | 0 |
| East Riding of Yorkshire Panel Committee ... ... ... ... ... ... | 10 | 10 | 0 |
| H. R. Unwin (Yeovil) ... ... ... ... | | 5 | 0 |
| J. E. Scales (Radstock) ... ... ... ... | | 5 | 0 |
| B. A. Crook (Timsbury) ... ... ... | | 5 | 0 |
| Brighton Public Medical Service ... ... | 10 | 10 | 0 |
| K. J. Atkinson (Halstead) ... ... ... | | 5 | 0 |
| W. A. Gornall (Nailsea) ... ... ... ... | 1 | 1 | 0 |
| E. M. Redman (Bristol) ... ... ... | | 5 | 0 |
| J. M. Dupont (Frome) ... ... ... ... | | 5 | 0 |
| Doncaster Local Medical and Panel Committee ... ... ... ... ... ... | 1 | 1 | 0 |
| Smethwick Medical Society ... ... ... | 3 | 3 | 0 |
| E. G. D. Pineo (Langford) ... ... ... | | 5 | 0 |
| Rochdale Panel Committee ... ... ... | 10 | 0 | 0 |
| Sheffield Panel Committee ... ... ... | 40 | 0 | 0 |
| Croydon Panel Committee ... ... ... | 5 | 5 | 0 |
| East Ham Panel Committee ... ... ... | 8 | 6 | 6 |
| Warrington Local Medical and Panel Committee ... ... ... ... ... ... | 5 | 5 | 0 |
| Southend Local Medical and Panel Committee ... ... ... ... ... ... | 5 | 5 | 0 |
| G. Pollock (London) ... ... ... ... | | 10 | 6 |
| | £1,619 | 16 | 0 |

# FOOD AND NUTRITION OF AFRICAN NATIVES

The publication by the International Institute of African Languages and Cultures of a special number of its journal, *Africa*,[1] devoted to the food and nutrition of African natives, presages a movement which, if properly organized and executed, will be of inestimable benefit to these peoples. It has, too, another interest, in that it affords an unrivalled opportunity to advance our knowledge of the relations of food and nutrition to health and disease. The movement has an interest, therefore, which is not confined to Africa. It is apparent from the material contained in this number of *Africa* that malnutrition of varying kinds and degrees is widespread among the natives; indeed, as Mr. E. B. Worthington tells us in his admirable opening article, "nutrition lies at the root of many of Africa's problems." "Nearly all medical men," he says, "who work in rural Africa have been driven to the conclusion that for improved health the native must have better food, and this is not the mere expression of opinion by local experts, but reflects a tendency in medical science during the past few years to stress the value of adequate and well-balanced diet in the maintenance of health." "In an under-nourished population . . . the mere treatment of disease, no matter how effectively and widely carried out, will achieve but negligible results. The first need is a continuous supply of sufficient and well-balanced food for the native to enable him to resist infection."[2]

## Native Diet and Metabolism

But despite this consensus of opinion little direct research has been done, and the need for it is urgent. What does the native eat? What effects does his diet have? What determines his choice of diet? What changes should be made in his accustomed diet? Are those European articles of food which he is prone to adopt good substitutes for those on which he formerly lived? In what ways does his metabolism differ from that of the European? Is it correct to assume that he requires the same proportions and quantity of food constituents as the white man in Europe or America? In short, what constitutes a sufficient and well-balanced diet for the African native, and how can it be secured for him? These are questions that urgently demand answer, and one purpose of the Institute in devoting this number of *Africa* to food and nutrition is to direct attention to the best means of providing answers to them. The provision of these means is "very much a British responsibility, for we have definitely declared ourselves trustees for the natives of so large a proportion of Africa" (Sir Daniel Hall, 1936). The means suggested by the Institute—co-operative research—are such as will receive the approval of all those who are or have been engaged in the study of nutrition, whether at home or abroad.

"It is obvious that to complete a study of this type scientific experts of different kinds must co-operate. The chemical constituents of the native diet can be estimated by the biochemist. The physique and health of the natives must be described by a qualified medical officer [with, as Mr. Worthington suggests, the double qualifications of medical training and specialized knowledge in food and nutrition], while for a knowledge of the chemical composition of the soil, or the possible developments of animal husbandry, the agriculturist or the veterinary officer must lend their aid. Lastly, for a knowledge of the native's attitude to food and its production, his eating customs and methods of distribution, the anthropologist with his linguistic knowledge and training in observation will be an essential member of the team."

It is to be hoped that the Institute will see the fulfilment of its desire to have such a team at work in some selected area of Africa, and that different branches of the Government service—administrative, medical, educational, and agricultural—will lend to it their willing support. "Africa, at the moment, may be compared to a nutritional laboratory in which innumerable experiments on controlled diet have been progressing for a hundred years or so" (E. B. Worthington). It needs but the sickle of properly organized and directed research to garner a harvest which will be of the greatest value not only to the natives of Africa, but to other races of mankind. "Embrace we then this opportunity."

## Soil Deficiencies and Malnutrition

Sir A. Daniel Hall's Heath Clark Lectures, 1935—*The Improvement of Native Agriculture in Relation to Population and Public Health*[3]—deal at greater length with several of the subjects discussed in the April number of *Africa*. They lend weighty support to the conclusion expressed therein by Mr. E. B. Worthington that the several problems he raised in regard to food and nutrition of African natives "but reflect the basal deficiencies of the soil and hence of vegetable foods, whether of animal or man. The cure must lie in the improvement of soil fertility, of agriculture, and of the general standard of living." It is in detailing the means for this cure—"the means by which the African native can be given a higher standard of living and be relieved of the pressure of over-population, of the incidence of much preventable disease, and of the imminent menace of the destruction of their land"—that Sir Daniel Hall's lectures are so valuable. His first lecture deals with the threat of soil exhaustion by continuous cropping, and with the maintenance of soil fertility; his second with the reform of shifting cultivation, with its wasteful character, and with the methods by which it can be exchanged for a permanent agriculture; his third with the destruction of grazing by over-stocking, and with the incidence of soil erosion.

In his fourth lecture, which deals with native dietaries, Sir Daniel shows how the food supplies of Africa could be improved both in quality and in quantity. He quotes at length from papers and reports bearing on the nutrition of the natives—quotations that are most impressive in showing how widespread malnutrition is amongst them and how low is the general standard of living. "Malnutrition is," he concludes, "one if not the chief source of the incidence of disease among African natives." (But surely it is a slip of the pen or a printer's error that "attributes the prevalence . . . of scurvy in both South and East Africa to vitamin A deficiency in the ordinary diets.")

## Reinforcing the Native Dietary

Sir Daniel insists on the importance of the legumes, not only for the maintenance of the fertility of the land, but on account of their dietetic value. This value is undoubted, though they do not in general supply proteins "of high biological value." With the exception of glycinin of soya bean, which is complete, the proteins (phaseolin, legumin, legumelin) are incomplete. He insists, too, on the greater use that might be made of the groundnut (*Arachis hypogaea*) in native diets, on the desirability of evolving varieties of soya bean suitable to the conditions of upland Africa, on the greater production of green vegetables, on the establishment of a sequence of crops that "would provide the African native with a duly

[1] Vol. ix, No. 2, April, 1936. Oxford University Press, London. (6s. net.)

[2] The International Conference of Representatives of the Health Services of African Territories and British India, 1932. Vide *League of Nations Health Organization, Quarterly Bulletin*, 1933, No. 1, 115.

[3] Oxford University Press, London, 1936. (10s. 6d. net.)

balanced ration." He refers to the fact that in particular districts specific deficiencies, as of iodine and iron, might have to be supplied, and recommends that steps be taken to improve the supply of salt as an article of trade. "Calcium and phosphoric acid are generally present only in short measure in African soils, but the use of human excreta as compost will help to maintain the circulation of these elements." But "the most effective means of improving the dietary of many of the tribes would be to lead them to utilize more largely the milk obtainable from their cattle and goats." It may here be remarked that by this means the protein deficiencies of cereal grains and legumes would be made good. Eggs, too, would form a valuable addition to the native dietary, though he thinks they would be produced mainly for sale. His final lecture deals with administration, education, propaganda, the essentials of improved agriculture, reclamation of eroded lands, and the inevitable cost of the programme of betterment. In it he takes occasion to refer to the cognate problem in Great Britain of the adaptation of agriculture to furnish an improved national diet—"a matter of stark, staring importance."[4]

### Calcium Deficiency

Sir Daniel Hall's reference to the deficiency of calcium and phosphoric acid commonly present in African soils calls to mind certain publications[5] [6] by Dr. Robert Dumont of Brussels, in which he draws attention to the influence of calcium deficiency in the food of the natives of the Belgian Congo "on the evolution of the dysentery bacillus." He reports striking results in the treatment of bacillary dysentery in these people obtained by the administration of "milk of lime." "Il faut remettre du calcium sous une forme ou sous une autre aux indigènes." Calcium deficiency, though apparently common in African native dietaries, is not invariable. Thus the dietary study in the Bemba tribe of North-Eastern Rhodesia, carried out by A. J. Richards and E. M. Widdowson (*Africa*, loc.. cit.), revealed an intake of lime by the people of this tribe averaging 1.45 grams daily over eight months of the year: a figure which, according to American standards, is about optimum for this element. It is notable, however, that the intake of lime varied in this tribe with family and with season of the year. In some families during the "hunger months" (February and March) it fell well below the amount needed for maintenance—an observation which illustrates the importance of the co-operation of the anthropologist in the making of dietary studies.

[4] Armstrong, Professor H. E., F.R.S.: "Public Health and Agriculture," *Journal of the Royal Society of Arts*, April 24th, 1936, p. 622.
[5] *Revue Belge de Médecine Tropicale*, October 3rd, 1933, xiii.
[6] *Revue de Médecine et d'Hygiène Tropicale*, January–February, 1935.

# Reports of Societies

## INTRA-TYMPANIC MEDICATION: LOCAL USE OF THYROXINE

At the summer meeting of the Sections of Otology and Laryngology of the Royal Society of Medicine on June 5th, with Mr. HAROLD KISCH in the chair, a discussion was held on "Intra-tympanic Medication, with Special Reference to Thyroxine," a treatment suggested in a communication to the Section of Otology a little more than a year ago by the late Dr. Albert Gray.

Mr. DOUGLAS GUTHRIE said that otology during the past twenty years or so had passed through a phase of much surgical activity, with a tendency to neglect what might be called its medical aspects. The treatment of oto-sclerosis was still unsatisfactory, and had failed to keep pace with the increased knowledge of its pathology. The failure to discover a cure did not arise from lack of investigation or experiment. It was necessary only to glance at the report of the Oto-sclerosis Committee of the American Otological Society to appreciate how numerous and varied had been the methods suggested, tested, and finally rejected.

When Dr. Albert Gray related to the Section his experience of intra-tympanic injections of thyroxine in oto-sclerosis and so-called dry catarrh, he gave details of fourteen cases, with improvement in seven. Gray postulated that oto-sclerosis was the result of a defective vaso-motor response in the small blood vessels of the ear, and suggested that local applications of thyroxine might overcome the difficulty and relieve symptoms. He added that the beneficial effect of hyperaemia might explain the success of other methods, such as oto-massage or the local application of heat or diathermy, but in each case the congestion passed off much more quickly than that produced by thyroxine. The temporary improvement in hearing after taking nitrites and sometimes after alcohol might be similarly explained. The so-called flamingo tinge of the tympanic membrane which was found in about 10 per cent. of the cases and was usually ascribed to osteitis of the promontory shining through the membrane might rather be nature's effort to counteract symptoms by producing a hyperaemia. Other substances which produced a local hyperaemia had been tried, among them dionin, which was used by ophthalmologists in the treatment of corneal opacities, but in the one case in which the speaker had tried it he had found no effect, either for good or for ill. Dr. Gray had made it quite clear that his object was to produce hyperaemia without any inflammatory reaction. But was acute inflammation of any benefit in cases of chronic progressive deafness? What, for example, was the result on an established case of oto-sclerosis of an attack of acute otitis? No special observation seemed to have been made. A few years ago Sir Robert Woods suggested the intra-tympanic injection of a weak solution of iodine, holding that oto-sclerosis was a chronic inflammation probably due to a micro-organism, and that it should be treated by producing local inflammation without destroying tissue. The cure of a chronic infection by exciting acute inflammation was, of course, a principle used with benefit in many diseases.

### Selection of Cases

The indiscriminate use of the thyroxine treatment, or a wrong selection of cases, could only bring it into disrepute. The cases must be of recent origin, and the treatment was unlikely to be successful with elderly persons. It was rather surprising that this method of introducing a medicament into the tympanic cavity had been so seldom used in the past. Observers in America had recently investigated blood pressure in dogs after intra-tympanic injection of nicotine, sodium nitrite, and histamine, and had seemed to prove that drugs so introduced through the membrane might be absorbed into the general circulation.

In his original paper Gray described the technique in full detail, and there was no need to repeat his instructions. Gray had conveyed the impression that the treatment was extremely simple, but it did demand a certain degree of manipulative skill, it was not easy to puncture at the correct spot or angle, or to hold the point of the needle quite steady in making the injection. General practitioners were now using the method, and patients were coming to demand it, and it was rather important, therefore, that a body of otologists should sound a definite warning against indiscriminate use or the notion that the procedure was quite simple. The thyroxine was powdered and suspended in slightly warm water. Gray recommended a fortnightly injection to each infected ear and a course of three to six injections, treating the two sides

alternately. None of the patients treated in the speaker's experience had complained of pain, and there was no case of haemorrhage or infection—indeed, it would be rather difficult to cause infection by intra-tympanic injection. No cough reflex was noticed, and he wondered whether this reflex was diminished or absent in oto-sclerotics. The patients paid little attention to audiometer or tuning-fork results, but wished to hear the conversational voice, and while the instrumental tests often registered no improvement, the patient himself declared that he heard better. Did the treatment merely stimulate the will to hear, and awaken the dormant faculty of attention? It had been said that any treatment would improve hearing in the average case of oto-sclerosis. Some critics might attribute the benefit of thyroxine injections solely to the puncture of the tympanic membrane. The most logical test would appear to be with a voice for which the patient was not at the time listening. When hearing tests were applied the patient was primed up to react, and was listening intently, but if in his own home he heard the telephone bell which he had not previously heard, or an unexpected remark from a member of his family, that was the best test of hearing capacity. He had treated only five cases; four of them had improved in hearing, and in two the improvement was clearly demonstrable by hearing tests. There was a natural tendency to exaggerate the value of any remedy or mode of treatment, especially when applied to a disease previously regarded as incurable; but he thought the injections deserved a trial in selected cases.

### Results at Middlesex Hospital

Dr. GAVIN LIVINGSTONE described the results in a series of undoubted oto-sclerosis cases treated at Middlesex Hospital following upon Dr. Gray's paper. Tinnitus was present in nearly two-thirds of the cases treated. All the patients selected for treatment were tested with the pure tone audiometer, both by air and by bone conduction, and other hearing tests were employed, including the conversational voice, the whisper, and the watch. The technique employed in treatment followed in all details that of Dr. Gray. No trouble was experienced in injection. Complications following injection might be divided into immediate and remote. The immediate complications were few. Most patients complained of pain and numbness radiating down the neck, lasting for twenty minutes, or sometimes in a mild degree for forty-eight hours. The most frequent remote complication was deafness caused by haemorrhage at the site of injection. Out of 360 injections no case of infection of the middle ear had been recorded, and with aseptic precautions there was no need to fear such a complication. In one case some facial nerve palsy was experienced.

Objective improvement on audiometer test was infrequent, but subjective improvement was more common, and it was impossible to disregard entirely the patient's own conviction that he heard sounds he had been unable to hear before, especially if this was confirmed by his friends and employers. The total number of cases treated was twenty-five, and of these five showed an objective improvement on the audiometer. The total number of ears (not cases) improved by over 10 per cent. of hearing units was six out of a total of fifty; the number of ears made worse by over 5 per cent. was four. The improvement in subjective tests was frequently not confirmed by the audiometer, and the converse was occasionally true. Subjective improvement occurred in eight cases. Tinnitus was present in sixteen of the cases and was improved in six. Finally he related some experiments on cats with intra-tympanic injections of thyroxine solution, flavine being used as a control. The results showed infection to occur in cats very easily, and the histological changes of the mucosa were due to sepsis rather than to the action of the thyroxine. The appearance of the middle ear after three hours was the same whether flavine or thyroxine had been injected, and there was no evidence proving that thyroxine had a specific action in bringing about congestion of the mucous membrane. The speaker was doubtful whether the optimism expressed in Dr. Gray's paper would be fully justified.

### A Critical Analysis

Dr. STEPHEN SUGGIT gave an analysis of a series of cases, the greater number of which were clinical oto-sclerosis, though others of more doubtful clinical definition had been added. Intra-tympanic injection under local anaesthesia had been carried out according to Dr. Gray's technique. Injections had been given as a rule on alternate sides at weekly intervals in the bilateral and at fortnightly intervals in the unilateral cases. In a short-period series of eighteen cases, in which two injections were given for each ear, three were worse, six showed no change, two showed only subjective improvement, three showed improvement in bone conduction only, and four showed improvement in air and bone conduction. In a longer-period series of twelve cases, with four injections on each side, no case was worse, four showed no change, three a subjective improvement only, one an improvement in bone conduction only, and four an improvement in air and bone conduction. Thus twelve out of thirty cases showed some improvement in hearing, and of the twenty-two cases which had tinnitus six were relieved partially or completely. The follow-up, however, had been disappointing, and no sustained improvement in hearing, subjective or objective, had been obtained. Out of eleven cases in which normal saline only was injected—two to four injections for each ear—seven showed demonstrable improvement, and out of six which had tinnitus there was improvement in three. Little practical result other than marked improvement in tinnitus in some cases had been obtained by intra-tympanic injection of thyroxine. What results were obtained were paralleled, if not exceeded, by substituting normal saline. He felt convinced that the results were due entirely to the mechanical effect of the fluid in the middle-ear cavity.

### Amount of Thyroxine Injected

Dr. T. B. JOBSON described a series of fifteen cases of oto-sclerosis treated by injections of thyroxine—eleven females and four males. In two of the cases he had not used an anaesthetic, and he found that there was practically no pain in injecting the normal membrane. It was only the inflamed membrane that was so acutely tender. In the earlier cases the quantity of fluid injected was gradually increased from five minims to ten, but it was found that the extra fluid was rapidly excluded from the tympanum through the Eustachian tube and the pharynx. Six minims appeared to be the most suitable dose, and it was of no use injecting more than that quantity. In a few cases after treatment deafness was increased for a day or two, and there was also an unpleasant feeling in the ear, but no serious symptom resulted, and there was no otitis media in any of the cases. In a few of the cases a tiny clot formed on the tympanic membrane, but the small scale was easily removed on the next day of injection a fortnight later. Seven of the patients were between the ages of 20 and 30, and eight were over 30. So far as hearing was concerned the effect of treatment was to give a definite improvement in one case, a slight improvement in six, and no improvement in eight. Five of the seven improved cases were in patients under 30. Altogether the results were a little disappointing. He had hoped to find a method of treatment which promised some real success, so that it would be a permanent monument to its brilliant and beloved originator; but by a careful selection of cases and the exclusion of patients of older ages an improvement on the present results should be possible.

Mr. R. R. SIMPSON gave particulars of forty cases treated according to Dr. Gray's method, all of them true cases of oto-sclerosis. With one exception deafness had been present in all of them for a year or more. In the one case without deafness there was tinnitus of eighteen months' duration and a family history of deafness. Tinnitus was present in thirty-five out of the forty cases. Paracusis was present in twenty-one cases, absent in thirteen, and not recorded in six. The treatment given was exactly as described by Dr. Gray. Each case was given six injections, three for each ear, at weekly intervals. Hearing was estimated by conversational voice; the

audiometer was not used. After treatment was completed a month was allowed to elapse before the patient's hearing was tested and recorded again. Recently he had sent out a questionary to these patients. To his question whether the hearing had improved since the injections twenty-three said that it had and thirteen that it had not ; twenty-one said that their friends testified to an improvement in their hearing, and fourteen that they did not ; twenty said that tinnitus had improved, eleven that it was the same, and three that it was worse.

### Other Experiences

Mr. RITCHIE PATERSON said that following upon Dr. Gray's address he took up the treatment at once, and carried it out at first indiscriminately, but later he restricted the method only to those cases for which it was originally intended by Dr. Gray. He gave particulars of thirteen cases, six of which had a family history of oto-sclerosis and eleven had well-marked tinnitus. In eleven of the thirteen cases there was marked improvement in the hearing on the patient's own testimony, and of the eleven cases nine were improved, in four this symptom disappearing completely. Dr. JOHN ACOMB said that this method of medication had proved of value in many cases of tinnitus ; it was well worth while, and had been very gratifying to patients. Mr. C. DE W. GIBB said that he had tried the method in only five cases ; in one of them there was considerable improvement, and in another the tinnitus completely disappeared after the first injection and had not returned. Mr. ALEX. SHARP expressed the view that in general in about one-third of all cases treated there was improvement subjectively both in hearing and in tinnitus. He recalled two oto-sclerotics who contracted scarlet fever, and in both of them the ear condition was much improved afterwards. Mr. F. C. ORMEROD wondered whether thyroxine itself had anything to do with the result. Comparable results, apparently, were obtained with normal saline. It seemed that some pharmacological work needed to be done with the object of discovering a better substance than commercial thyroxine, possibly the more recent extract of thyroid gland. Mr. R. A. WORTHINGTON mentioned the possible value of the puncture pure and simple.

Mr. DOUGLAS GUTHRIE, in reply, said that one important outcome of the discussion might be that, while thyroxine was not very valuable, the method itself was of service, and continued experiment with other substances might lead to greater successes.

## OXYGEN DISSOCIATION CURVES OF HAEMOGLOBIN

At a meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland, with the president, Professor J. M. O'CONNOR, in the chair, Dr. MCCARTHY read a paper on the oxygen dissociation curves of haemoglobin. He reported that solutions of foetal and maternal haemoglobin were prepared by Adair's method from the blood of goats at different stages of pregnancy. Oxygen dissociation curves measured on these solutions showed that the foetal curve lay to the left of the maternal—foetal haemoglobin had a higher affinity for oxygen than maternal haemoglobin. Hall (1934) had verified this in the goat and other species. These results were partly explanatory of differences observed in the bloods by Barcroft and his associates (1933). Haurowitz (1935), using a spectroscopical technique, had measured the oxygen dissociation curves of haemoglobin from the newborn baby and its mother. The foetal curve lay to the right of the maternal, showing a lower affinity for oxygen. These results were subsequently confirmed by R. Hill (Barcroft, 1935). Two oxygen dissociation curves of the haemoglobins of a newborn baby and its mother were shown. The blood was obtained at a Caesarean section at full term by Professor J. J. Kearney of Cork. For equilibrium the Barcroft saturators had been used, and for analysis the Van Slyke pump. The foetal curve differed from the maternal, but the difference, unlike that observed by Haurowitz and Hill, was in shape rather than in position. In the notation of Hill's equation the foetal curve had a lower value of " N "—an observation in accordance with previous work on haemoglobin by McCarthy (1933) and Barcroft and others (1934). Oxygen dissociation curves of haemoglobins of different species were also shown. Some of these differed markedly in their oxygen affinities.

Professor D. M. BARCROFT asked if there was any evidence to show comparison between the oxygen dissociation curves in the early human foetus and in animals. Much of the foetal work which was now being done brought out interesting points regarding human obstetrics. Professor W. J. W. JESSOP asked if there was any difference in the haemoglobins in respect of the power of combining and setting free of oxygen, and, if so, what change took place in the molecules to give the oxygen this dividing power. The PRESIDENT suggested that some differences in structure in the placenta in human beings and in animals might account for the difference in the curves referred to by Dr. McCarthy.

Dr. MCCARTHY replied that from the curves he had obtained it might be assumed that human foetal haemoglobin had a lower affinity for oxygen than animal haemoglobin. The differences in the haemoglobin molecule had been worked out by various observers, and the results were very disappointing and discouraging.

## ROYAL ACADEMY OF MEDICINE IN IRELAND

At a meeting of the Section of Obstetrics and Gynaecology of the Royal Academy of Medicine in Ireland, with the president, Dr. J. F. CUNNINGHAM, in the chair, Dr. A. H. DAVIDSON (Master of the Rotunda Hospital) reported a case of endometriosis involving the recto-vaginal space.

The patient, aged 39, had been married thirteen years ; she had had one child and one abortion. The last pregnancy was eleven years previously. She now complained of pain in the left side during menstruation, and difficulty and some pain with defaecation. Menstruation had been normal otherwise. The uterus was normal in size, retroposed, and adherent somewhat in the posterior fornix. An indurated mass projected into the posterior fornix in a polypoidal manner, but without any break of the vaginal mucous membrane. The mass could be felt from the rectum, which appeared slightly adherent to it over one small area. The mucous membrane of the rectum was intact. A mass and adhesions were present in the area of the right appendages. Endometriosis was diagnosed, and it was decided to perform a total hysterectomy, with removal of the indurated area. At the operation a large chocolate cyst, adherent to the pouch of Douglas, was found in the right ovary. There were many endometriomatous thickenings and adhesions in the peritoneum covering the lower part of the back of the uterus. Douglas's pouch was largely occupied by a thickened indurated mass attached to the back of the cervix and posterior fornix ; to it the middle third of the rectum was densely adherent. Total hysterectomy, with resection of both ovaries and tubes and as complete as possible a removal of the indurated mass, was performed in the routine manner. It was found difficult to separate the rectum from the mass, and it was inadvertently holed to the size of a florin piece. This was carefully closed by two layers of continuous catgut, the second one being inserted as a Lembert suture. A small drain was led down to Douglas's cul-de-sac, and the abdomen was closed. The bowels were kept closed for four days ; this was now the eighth day of convalescence, and so far there had been no complication. The tube was removed on the fourth day. The complete specimen and microscopical sections had been prepared by Dr. Dockeray, and were on view. Sections of the growth showed the vaginal mucosa at one edge and the essential feature of endometrial glands and stroma of the type of the corporeal mucous membrane, and at the other edge a typical section of rectal mucous membrane, where a piece of adherent rectal wall had been accidentally removed in performing the hysterectomy.

The Master said that Lockyer had collected forty-seven published cases of this condition in 1918. The lesion started in the recto-vaginal septum and spread forwards into the cervix, downwards into the fornix, and backwards into the rectum or laterally into the broad ligaments, causing immobilization of the affected structures.

In the fornix polypoidal masses projected ; they became painful during coitus, and might actually bleed during menstruation. These symptoms still persisted even after subtotal hysterectomy. Invasion of the wall of the rectum led to increasing constipation and painful defaecation, and might simulate carcinoma of the rectum.

The PRESIDENT remarked that this condition had been reported frequently of late, but this was the first genuine case of endometriosis which had been brought before the Academy. The vaginal septum was the most common place for this condition to occur. The difficulty of operation in these cases was very great ; there were very dense adhesions, and sometimes it was very difficult to separate the rectum from the vagina. Dr. G. C. DOCKERAY said that, as well as endometriosis of the recto-vaginal septum, there were endometrial growths on the back wall of the uterus which had apparently come originally from the ovary. The vaginal mucous membrane was intact. Most of the endometrial tissue was nearer to the rectum than to the uterus. Endometriosis of the recto-vaginal septum was difficult to explain, but he personally thought that in this case a Müllerian origin was the most likely. He referred to a patient who had refused operation, and died. Her ureters became constricted, cystitis followed, and she died from uraemia with bilateral nephrosis. Some of the endometrial glands had become cystically enlarged in the epithelium. It was unusual to find endometrial glands with such large chocolate cysts as were present in the case described by the Master of the Rotunda Hospital. Dr. F. DOYLE asked if the Master had been able to remove all the endometrial tissue in this case. Dr. NINIAN FALKINER said that these cases often occurred in sterile women ; the distribution of the ectopic endometrial cells did not correspond in position with the position of cells found in pregnant women. He asked if the Master thought that these cells were derived from rectal endometrium.

Dr. DAVIDSON said that as far as possible he removed all the endometriomatous tissue which was present in the recto-vaginal space. Once the ovaries had been removed the endometrial islands tended to disappear altogether; in this case both ovaries had been removed. There were a number of views regarding the origin of these endometrial growths. He had no doubt that there was a real chocolate cyst present, since it was obviously connected with all the other material, which was certainly endometriomatous tissue. He had never been afraid of making a hole in the rectum, and believed that if this was done and the hole was carefully stitched up no ill effects followed.

# Scotland

### New Dermatological and Venereal Department at Edinburgh

At the formal opening of the new building which now houses the dermatological and venereal departments of the Edinburgh Royal Infirmary, Sir Norman Walker, consulting physician to the dermatological department, after performing the opening ceremony, outlined the development of this specialty in Edinburgh. He said that the first man to do anything practical for dermatology in Edinburgh was John Hughes Bennett, who, in 1848, became professor of physiology in Edinburgh and shared, in rotation with Professor Laycock of the chair of medicine, the charge of the clinical wards. There was then no provision for treating diseases of the skin, and Bennett, concluding his introductory lecture, said, " We shall never rest contented until the Edinburgh school of medicine is complete in all the means necessary for studying every kind of disease at the bedside." When the present Infirmary buildings were opened in 1879 there was no provision for a skin department. Beds were first set aside for skin diseases in 1891, when six in each of two small wards on the lower corridor were allotted equally to Dr. Peter McBride for ear and throat diseases and to Dr. Allan Jamieson for skin diseases. In 1903 a new ear and throat department was occupied, and the twelve beds all came under Dr. Jamieson's charge for skin diseases, but there was still no other accommodation for out-patients. In 1905, on the opening of the eye department, the wards previously assigned to eye cases were allotted to the skin department, and for the first time there was room for the ever-growing number of out-patients. The department continued to increase, and it became obvious that a new skin department was one of the most pressing needs of the Royal Infirmary. In many countries of Europe and in America it was the custom for skin and venereal diseases to be treated in the same department. This had been considered but rejected for Edinburgh, although a compromise had been reached and the two departments were housed in one building. Sir Thomas Whitson, who presided at the ceremony, said that the capital sum required to erect the new building had been provided entirely by the Royal Infirmary, but that the Edinburgh Corporation would pay rent for the part of the building occupied by the venereal department, and would provide its medical service. The building has cost approximately £40,000 exclusive of fittings and furnishing, and is built on modern lines. Ferro-concrete has been used throughout with an outer wall of synthetic stone and an inner lining of brickwork. The building has five floors and a basement. The first three floors are devoted to the treatment of venereal diseases, and the upper two to skin diseases. The total number of beds provided in the venereal department is thirty-eight, and in the skin department forty-six, and special baths have been fitted for the skin wards. There are treatment rooms with ample dressing-room accommodation and adequate facilities for teaching. Several new features in hospital design have been introduced, including radiators of a new panel type fitted into walls below the windows, and a " double-curved " skirting so that beds and furniture cannot damage the walls and paint work. The floors are laid with thick linoleum applied direct to the concrete. Light fittings are of the enclosed type, and for night use the lights in the corridors are two feet from the floor to prevent rays penetrating the fanlights of the wards.

### Assistance for Incurables

At the annual meeting of the Edinburgh Royal Society for Home Relief to Incurables and of the Dunlop Cancer Fund, Lord Provost Gumley said that there had been no diminution in the number of claims for assistance in spite of the improvement in the general trade conditions of the country, and applications for relief had been received from all parts of Scotland. During the past year the society had distributed £5,031 among 455 beneficiaries at the rate of about £11 per annum. The total revenue for the year had amounted to £6,928. In connexion with the Dunlop Cancer Fund, which existed for the relief of patients suffering from incurable cancer, a sum of £2,287 had been distributed last year.

### Neuro-psychiatric Research Institute

In the annual report of the West of Scotland Neuro-Psychiatric Research Institute Dr. W. M. Ford Robertson, the director, points out that there has been a growing need in the work of the Institute for access to a greater number of acute and incipient cases of mental disorder. In the Glasgow area the methods of entry for virtually all such cases are the general hospitals and not the mental hospitals with which the Institute is associated. If research into the physical basis of mental illness is to advance it must be directed towards the attainment of more specific as against symptomatic therapeutics. To be successful it should have its foundations on more than

clinical diagnosis, and in this matter a research laboratory plays an important part. The Institute is now mainly directing its activities to the large group of patients whose illness comes under the diagnosis of a functional condition. The matter has been discussed with the medical officer of health and those in charge of observation wards, and it is hoped that in the near future a partnership may be made between these and the Institute. The number of persons admitted to the observation wards in Glasgow numbered over 1,800, and of these about 500 could provide material of great potential value for pathological investigations, for diagnostic and therapeutic studies, and for propagating the purely technical side of the Institute's work. The revenue of the Institute for the past year was £2,187, and the expenditure £2,029.

# England and Wales

### Otolaryngologists at Dinner

On the evening of June 6th the members of the Sections of Laryngology and Otology of the Royal Society of Medicine brought their joint summer meeting to an end by dining together at the May Fair Hotel, with Mr. Lionel Colledge, president of the former Section, in the chair. In a short speech of welcome the chairman referred to the many and grievous losses suffered by both Sections during the past year, especially the deaths of Dr. Albert Gray and Sir Charles Ballance; and paid well-turned compliments to four of the guests: Dr. G. Öhngren of Stockholm; Major-General Sir Charles Macwatt, formerly Director-General, Indian Medical Service; Colonel A. E. Hamerton, pathologist to the Zoological Society; and Dr. N. G. Horner, Editor of the *British Medical Journal*. Sir Charles Macwatt, acknowledging the toast, thanked his old friend Mr. Colledge for giving him the opportunity to be present among members of the two specialties, and spoke of his teacher at Glasgow, Sir William Macewen, as one of the pioneers of otology. Dr. Öhngren (who was paying literally a flying visit to London) expressed the pleasure he felt at meeting British colleagues in joint session, and the delight given him by Colonel Hamerton during the interesting visit to the Zoological Gardens and prosectorium. He assured the company of the high regard and admiration in which English science is held by Sweden. Dr. Johnson of South California also offered greetings and thanks. Mr. Harold Kisch, president of the Section of Otology, proposed the chairman's health. Lionel Colledge, he said, had many claims to fame, but in the popular eye he was perhaps most famous as the father of an Olympic skater. Mr. Colledge, in reply, praised the honorary secretaries for the success of the meeting, and proposed their health, to which toast Mr. Thacker Neville and Mr. F. C. Ormerod replied. Sir StClair Thomson, describing himself as now an onlooker who had been produced as a genuine antique, added a few words in appreciation of the work of the summer meeting. He thought that the tendency to "debunk" was a good thing, for it stopped the spread of error and the hunting of bad hares. "You are all," said Sir StClair, "living in the golden age of laryngology," and here he paid tribute to the pioneers who had made this so. Mr. Herbert Tilley also was persuaded to tell a few stories before this pleasant evening party came to an end.

### Conference on Child Care

A National Conference on Maternity and Child Welfare, under the patronage of Queen Mary, will be held at the Picton Hall, Liverpool, on Wednesday, Thursday, and Friday, July 1st, 2nd, and 3rd, under the presidency of Mr. Geoffrey Shakespeare, M.P. (Parliamentary Secretary to the Ministry of Health). The conference has been organized on behalf of the National Council for Maternity and Child Welfare, and certain of its constituent bodies, by the National Association for the Prevention of Infant Mortality, in co-operation with the Maternity and Child Welfare Group of the Society of Medical Officers of Health, which will also hold a short clinical course for medical practitioners on July 4th. The subject for discussion throughout the conference will be "The Promotion of Maternal Welfare in Relation to Child Health," and the following aspects, among others, will be included: maternal welfare and the public; ante-natal nutrition; the education of parents through day nurseries and nursery schools; parents and substitute parents; the importance of co-operation between maternity and child welfare services and the specialist health services; rest and convalescence as factors in maternal welfare. The conference is open to all who are interested in maternity and child welfare; the fees for full membership, including the receipt of all printed matter, are £1 1s. per member, or in the case of two, or of three, members representing the same local authority or voluntary organizations 15s. and 14s. each respectively. Applications for tickets, with remittances, should be sent to Miss Halford, honorary secretary, National Association for the Prevention of Infant Mortality, 117, Piccadilly, W.1.

### Care of Children under School Age

The Minister of Health has issued a communication to maternity and child welfare authorities urging increased supervision of the health of children under school age. He states that while arrangements for safeguarding the health of children up to the age of 18 months or 2 years are generally satisfactory, not enough attention is being given in many areas to the health of children between 18 months and 5 years. There should be systematic and periodical health visiting of these children, the health visitors where necessary advising the mother to consult the family doctor or to take the child to the appropriate clinic. In some places special "toddlers' clinics" are held at the infant welfare centres, and in some the school clinic is available for treating minor ailments and special defects. The Minister commends both these arrangements, but points out that their general success depends to a large extent on regular and efficient health visiting to induce the mother to make use of the facilities available. The success of these arrangements, the Minister adds, will be assisted by effective co-operation between the maternity and child welfare and the school medical services. The Local Government Act, 1929, provides machinery for transferring maternity and child welfare services to local education authorities, and, in general, the health interests of pre-school children will be best served if responsibility for attending to their health from birth to school-leaving age is in the hands of the same authority. The memorandum also draws attention to the value of day nurseries. The circular (No. 1550) has been placed on sale, and copies may be obtained, price 1d., from the Stationery Office or through any bookseller.

### Treatment of Early Mental Disorder

Various extensions and improvements in equipment are being planned at the Bucks County Mental Hospital at Stone, Aylesbury. There is still much overcrowding, even though some of the pressure has been relieved by boarding-out methods. One-third of the admissions were received without the necessity for certification, and Dr. Ian Skottowe, the medical superintendent, believes that help would be gained in the proper working of the Mental Treatment Act if the ease with which general practitioners can deal with cases on a temporary and voluntary basis was more widely realized. The annual report of this institution for the year 1935 shows that the committee of management has entered upon a policy of consolidation of mental health services step by step with its extensive building programme. Sketch plans have been prepared for a new reception unit, convalescent villas, parole villas, workshops, and nursing home. Dr. Skottowe empha-

sizes the importance of securing the treatment of the early case and of avoiding certification, treatment and prevention being aimed at rather than custody in mental illness. This, he points out, is best achieved by co-operation with local voluntary general hospitals, so that the nervously and mentally sick may seek advice at such hospitals in the first instance, just as they would if they were suffering from any other form of serious illness. He hopes that negotiations may reach a stage of concrete agreement between the Bucks County Mental Hospital and one or more appropriate general hospitals before long. He adds that there may be cases in public assistance and other county institutions for which specialized psychiatric advice may be desired, and that mental hospitals should be able to provide such consultative service if required. Proper facilities are also essential for suitable medical treatment of early cases, and also for discrete and proper classification on a medical basis, so that the early sensitive case shall not be aggravated by being brought into contact with more advanced cases of repugnant or even revolting nature. There must therefore be provided on a separate block system a reception unit for the intensive treatment of recent cases ; convalescent accommodation ; a special ward for the physically sick ; blocks for the quiet and well-working but protracted cases, which are no longer amenable to active treatment ; and also accommodation for the chronic, dilapidated, noisy, and unpleasant cases. Other essentials are a pathological laboratory, an operating theatre, continuous baths, and facilities for treatment by occupational and psychological means.

### Chest Surgery at Preston Hall, Maidstone

The report recently issued by the medical director of the British Legion Village, Preston Hall, covers the two years October 1st, 1933, to September 30th, 1935, and records numerous fresh developments. The announcement is made of the installation of a new *x*-ray apparatus which will provide additional and improved facilities for diagnosis and treatment. Some of the first pictures taken in England by this apparatus, the tomograph, are published in the report, and show how the diagnosis of cavities in the lungs has been facilitated. Dr. J. B. McDougall incorporates some critical notes of the place taken by surgery in the treatment of pulmonary tuberculosis, but he points out the necessity of informing the patients of the relatively extensive nature of many of the plastic operations. The severe trauma and shock which result in some cases limit the number of cases available for treatment. He believes that collapse therapy by surgical operative measures is not likely to prove a success unless there is some local tendency towards healing. In the type of case which is predominantly exudative in nature collapse therapy is ineffective and may be dangerous. Ligature of the pulmonary vein, as suggested by Kerschner, has been tried in six cases at Preston Hall, thoracoplasty in fifteen (thirty-two operations), and rib resection in twelve. The surgical block began work in the latter part of 1933, and ninety patients had undergone operations during the time covered by the report, the number of operations being 167. Dr. McDougall feels strongly that it would be a mistake to multiply the number of centres for chest surgery in this country. He believes that the facilities for this work should be concentrated at various conveniently placed institutions, for considerable and continuous experience is essential for the successful adoption of surgical methods. Dr. McDougall adds that while it is a simple question of capital expenditure to provide an up-to-date theatre equipped to deal with advanced chest surgery, the provision of an experienced surgical staff is a different and more difficult matter. He is sure that surgical units in sanatoria cannot be repeated indiscriminately without grave risk of the surgical treatment of chest diseases as a whole falling into disrepute. This exceptionally valuable report concludes with reprints of articles published already elsewhere by members of the staff of Preston Hall, chiefly but not entirely relating to surgical therapy.

## CORRESPONDENCE

### The G.M.C. and Pre-registration Requirements

SIR,—The situation is even more confused and complicated than is indicated in your leading article (June 6th, p. 1166). It would be possible for an intending medical student who wished to escape the proposed more advanced examination in general education subjects to remain at school and confine himself to biology, to complete his course and take his examination in that subject, and *then* to begin his post-matriculation study of physics and chemistry elsewhere. Such an unusual programme might not be without some advantage in emphasizing the importance of general biology in the medical curriculum, but it is certainly the opposite of what was intended by the majority of the members of the General Medical Council. If, as I fear, and as is certainly possible, the actual result of applying the new requirement to one set of students only is that an increasing number of boys and girls intended for the medical profession will leave school at 16 years of age, the effect on the educational quality of medical students must be deplorable. This cannot be compensated for by the recommended advance in the prescribed age for registration as a student from the present "seventeen years" to "the beginning of the term in which he attains the age of eighteen years," in the absence of any requirement of some pursuit of general educational subjects during that period. Insufficient consideration has been given by the Council to the effects of their new resolution.—I am, etc.,

London, N.W., June 7th. HENRY B. BRACKENBURY.

SIR,—I have read with interest the report on medical education and registration and the consequent resolutions of the General Medical Council in the *Journal* of June 6th and the leading article in the same issue. As one who has taken some part in various discussions on this question I looked forward to the report. The proposed changes, *if they are brought about*, should result in some measure of improvement. There yet remains much to criticize. It seems to me a great pity that Sir Henry Brackenbury's motion for an altered wording of the resolution dealing with pre-registration examinations was lost.

As is pointed out in your leading article, the adopted wording brings about a peculiar and unfair condition, requiring a boy who has taken his instruction in chemistry and physics at school to pass a further examination in one or two subjects of general education at a higher standard than that of the preliminary examination, whereas a boy who takes his course in chemistry and physics after entering a university or medical school is exempt from this. Sir Henry Brackenbury's wording not only avoided this anomaly but had the additional advantage of recognizing that there are other (and perhaps better) proofs of study than examinations.

In moving his amendment he said that the candidate should show that during the two years following the passing of the preliminary examination "he had not neglected his general education. There need be no rigidity about the way in which the object was achieved ; all he need be required to do was to produce evidence of having passed some higher certificate examination *or the certificate of his teacher.*" This is a suggestion that encourages the cultivation of the mind rather than the acquisition of a knowledge of facts from the point of view of reuttering these in an examination. If the study of medicine is to be on a broad basis it is surely advisable to encourage from the earliest stages not only a desire for

a broad culture as unrestricted in its lines as possible, but also the individuality of thought that is too much hampered by the examination system.

Dr. Le Fleming, as reported in the discussion, deplores the fact that the term "general practice" does not occur in the report. I wholly agree with him that the aim of the curriculum should be to send out men well equipped as general practitioners. I should have liked to see some emphasis laid on this, and on the need for eliminating much scientific detail of no value in achieving this aim. No doubt improvements have taken place, but I believe too much time is still taken up by such detail.

I am far from belittling the need for training in scientific observation and reasoning; indeed, this is just where one sees deficiency to-day. There is, however, plenty of scope for this training in matters related to the clinical subjects. In view of the present trend of medicine sufficient recognition is not given to the need for teaching preventive measures. In this connexion I expected there would be some reference to the study of the beginnings of disease.

The report, I believe, will be regarded as disappointing by those of the general body of the profession who are interested in medical education.—I am, etc.,

Edinburgh, June 7th. A. F. WILKIE MILLAR.

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SIR,—Your article on the medical curriculum will commend itself to every thoughtful practitioner who desires that the profession should merit the title "learned." The socialization of the practice of medicine by the national health insurance scheme has tended toward its mechanizaion at the expense of its personal and profound nature. Moreover, it is to be regretted that the General Medical Council has ignored the guidance of recorded experience of the educationists and also the science of pedagogics based on experience and mental science.

Many years ago I suggested that some elementary knowledge of the philosophies and psychology should be included as preparatory studies, linking up medicine with the mysteries of life and consciousness and giving a broader foundation for higher attainment in theory and practice.

Diagnosis is based on circumstantial evidence. It must have occurred to most medical men who remain students that it is not merely the subjects taught, but the order in which they are presented, so as to arouse a sequence of interest and prepare the mind for the on-coming one, with an appetite for further knowledge. The dissection of the cadaver in its weird atmosphere, and before interest has been aroused in it as the abode of life, at the beginning of his career has often turned a promising student from the pursuit of the profession.

The criticisms put forward are so common-sense and plainly presented that they should appeal to all who have the prestige of the profession at heart.—I am, etc.,

Southampton, June 8th. ARTHUR KING.

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SIR,—There must be hundreds of doctors (to say nothing of other people) who, in obedience to the recent order of the General Medical Council that preliminary scientific subjects shall be thrown back on the school, have hastily jettisoned the Humanities and transferred their sons to the Science side. Now they are suddenly and peremptorily informed that the "cultured" physician is again *de rigueur*, and that if he has matriculated in chemistry and physics the boy shall forthwith cease to study these subjects so long as he remains at school under threat of yet another examination!

Does this last order cancel the first one, and if so where is the boy to restart studying for preliminary scientific, say, at eighteen years of age? Also, do the General Medical Council themselves know what they either mean or want, and if so might not an authoritative pronouncement be made long before January, 1938, and before the university careers of many present public-school boys are either jeopardized or ruined?—I am, etc.,

FREDERIC SANDERS, M.B., B.S.

Highams Park, E.4, June 7th.

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## Nervous Symptoms Complicating Measles

SIR,—In February last, during a local measles epidemic, I saw with Dr. S. Devine of Parkstone a boy aged 11 with encephalomyelitis accompanying measles. As in the case reported by Dr. John Parrish in the *Journal* (June 6th, p. 1159) convulsions were a prominent feature.

On February 10th, 1936, the measles rash appeared; the symptoms were mild till February 13th, when the boy became quiet and had photophobia. The temperature was found to have risen, and at 7 a.m. next day convulsions began, and were almost continuous till 9.30 a.m. At this time the movements were confined to the left half of the body, each attack lasting half to one minute and separated by intervals of about the same length of time. The patient was in coma both during and between the attacks. He was given 1/6 grain of morphine subsequently and 100 grains of sodium bromide per rectum; after fifteen minutes the convulsions ceased permanently. A lumbar puncture then showed a cerebro-spinal fluid pressure of 120 mm. The first few drops only of the fluid were blood-stained. On examination it contained red blood cells (traumatic) 500, white cells 8 per c.mm.; albumin 45 mg. per cent. An excess of globulin and no organisms were found. During the next few days the child was irritable, complained of headache, and vomited several times; but the temperature settled to normal about two weeks after the onset of the nervous symptoms, and recovery was then apparently complete. Symptomatic treatment only was given. He has remained perfectly well, with no mental or other sequelae.

—I am, etc.,

Bournemouth, June 6th. HAROLD COOKSON.

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## Percentage of Alcohol in the Blood

SIR,—Dr. W. M. Fairlie (*Journal*, June 6th, p. 1182) quite rightly puts the question whether the estimation of the percentage of alcohol actually circulating in the blood can be taken as a "conclusive" test that a person is "under the influence of drink . . . to such an extent as to be incapable of having proper control of the vehicle." In reply I would like to make the following points:

1. Experiments have proved that everyone—be he a total abstainer or an immoderate drinker—with a percentage of alcohol in the blood above 0.1 shows clinical evidence of being "under the influence."

2. Should, therefore, this or a higher percentage of alcohol be present within a comparatively short time of the charge, the person tested is certainly "incapable of having proper control of the vehicle," for even at 0.1 per cent. his reaction time would invariably be delayed.

3. As I have previously stated, some people with lower percentages, even as low as 0.088, have been found to be "under, etc."

4. I quite agree with Dr. Fairlie that "incapacity from alcoholism is most variable . . . and will vary in the same individual within short spaces of time," but I believe that the more the problem is investigated the more will it be found that behaviour differs because of the variation of the blood-alcohol content, and that for some reason, possibly rapid oxidation, certain individuals, usually heavy drinkers, achieve a lower blood-alcohol content in a surprisingly short space of time.

It follows, therefore, that a direct estimation of this percentage is a logical procedure. As regards the accuracy

of the test I do not see why one should not accept the findings of an accredited laboratory in this as in other blood tests.—I am, etc.,

London, S.W.5, June 8th. H. KENNETH V. SOLTAU.

## Ultra-short Waves

SIR,—Dr. Turrell will find the evidence for my statement that "ultra-short waves" have no specific action and exert their effect by heating the tissues in a paper by Dr. H. J. Taylor (*Brit. Journ. Radiol.*, November, 1935), and in a paper by Dr. H. J. Taylor and myself in the *Lancet*, February 8th, 1936.—I am, etc.,

St. John Clinic and Institute of Physical Medicine, Ranelagh Road, S.W.1, June 3rd. LEONARD HILL.

## B. coli and Rheumatoid Arthritis

SIR,—The article by Drs. Gerald Slot and P. M. Deville in the *Journal* (June 6th, p. 1155) describes a small series of cases of rheumatoid arthritis in whose urine *B. coli* was found to be present. Before one attributes significance to such an association it might be well to ascertain whether a similar bacilluria does not occur in other conditions of profound and prolonged ill-health. Having nothing better to go upon, I turned up the old bacteriological reports of eleven persons suffering from chronic nervous exhaustion and found that three of them showed *B. coli* in the urine though there was no history of urinary symptoms.

In a disease so chronic as rheumatoid arthritis it is surely unusual to proclaim any result, good or bad, after a fortnight's treatment; such prematurity is peculiarly misleading in view of certain facts, which anyone can confirm. Some years ago I submitted a series of ten cases of rheumatoid arthritis to large doses of acid and a similar number to large doses of alkali. Improvement was invariable on both regimes, but equally invariable was a succeeding phase of definite retrogression during the third week (or earlier when the dosage was very high), resulting in such marked and rapid deterioration, especially with those receiving acid, that medication had to be abruptly abandoned. If Dr. Slot had persevered a little longer with his acid and alkali treatments he would have encountered the period of retrogression, which is by no means alarming.

The titration of many hundreds of urines over a period of four years has convinced me that in rheumatoid arthritis the body is abnormally sensitive to attempts to alter the *p*H of its fluids, and I am suggesting that Drs. Slot and Deville might do well to consider this aspect of the subject before they reach a final opinion on the value of *coli* disinfection in these cases.—I am, etc.,

London, W.1, June 8th. G. LAUGHTON SCOTT.

## Treatment of Rheumatoid Arthritis

SIR,—The series of articles on "Treatment in General Practice" now appearing in the *Journal* are written by senior members of the profession with a view to presenting to the general practitioner those forms of therapy, ancient or modern, generally accepted as being the best that medicine has to offer. In your issue of June 6th (p. 1171) Dr. F. G. Thomson described the treatment of rheumatoid and climacteric arthritis. The article included references to the treatment of focal sepsis, debility, anaemia, achlorhydria, chronic intestinal infection, and pain, together with such measures as arch supports, massage, galvanism, active and passive movements, plaster casings, reduced carbohydrate diet, spa treatment (with multiple subheadings), thyroid extract, reducing diet, crêpe bandages, iodine, counter-irritation in various forms, deep *x* rays, radiant heat, diathermy, etc. It must be admitted that this article is written on accepted lines, but we suggest that the multiplicity of remedies speaks for itself and explains the therapeutic hopelessness of this disease in the past.

A minor criticism might be levelled at the suggestion that achlorhydria plays a part in the aetiology of rheumatoid arthritis. Dr. Thomson states that achlorhydria occurs in 20 per cent. of these cases, but this is also the approximate incidence of achlorhydria in non-arthritic persons of the same age and sex distribution; it is therefore highly improbable that achlorhydria is an aetiological factor in this disease, and it does not require treatment as far as the arthritis is concerned.

But it is of the first importance that the reference to gold treatment should not be allowed to pass without comment; Dr. Thomson says: "Good results have been reported in some cases from treatment with gold. . . . The treatment is more or less experimental and of doubtful value." One wonders how long a new form of treatment remains in the experimental stage. In the past two years over 1,000 cases treated with gold have been recorded in this country alone, the first of these patients having been treated in 1928. In 1934 Forestier published his results in 500 cases, covering a six-year period, and claimed good results in 70 to 80 per cent. Pemberton found improvement in eighty-eight of his 100 cases in 1935, and a few weeks later, reviewing 100 cases, we described 10 per cent. of cures and improvement in a further 78 per cent. Good results have also been recorded by Slot and Deville and others in this country, and our own experience in the treatment of nearly 400 cases will shortly be published in the *Lancet*; further, similar good results have been recorded from many Continental clinics. In contrast with Dr. Thomson's multiple forms of therapy, we have used only gold salts in treating our patients. It is our belief—a belief shared by many others who have had considerable experience—that gold is the most important form of treatment for rheumatoid arthritis, and it is probably the only single form of therapy which ever effects a cure; it should therefore head the therapeutic list as a remedy of proved value.—We are, etc.,

STANLEY J. HARTFALL.
HUGH G. GARLAND.

Leeds, June 8th.

## Traumatic Heterophoria

SIR,—Mr. H. de Villiers's contribution to the *Journal* of May 23rd (p. 1050), under the title of "Traumatic Heterophoria," was of unusual interest. I cannot, however, agree with his description of these cases as examples of the 'phorias. On the clinical evidence available they appear to be atypical squints, and I think that "traumatic heterotropia" would have been a better title.

His paper is specially valuable in showing that an innervational imbalance of apparently "functional" origin can break down the fusion sense which normally prevents diplopia. I gather that Mr. de Villiers excluded the possibility of any focal damage, and therefore these cases can be regarded as the result of a dysfunction of the association centres subserving binocular co-ordination. The diplopia was, in fact, symptomatic of the traumatic neuroses from which these cases were suffering. The occurrence of such a diplopia is not surprising. Our high grade of binocular vision is phylogenetically of recent origin, and is easily disturbed by stresses which would leave coarser mechanisms relatively unaffected. I recently saw a similar case with a non-traumatic history.

A lady of 58 years complained of a homonymous diplopia, which had commenced about two years previously, following the shock of her mother's death. It was presumably due to an esophoria becoming a patent squint, owing to the breakdown of her binocular control. She had been wearing prisms clipped on to her spectacles, but now the strongest prisms which could be so worn were insufficient to prevent diplopia. Her right vision was 6/6 and her left 6/12, partly. I presumed that a spontaneous improvement of her squint had been prevented by the comparatively low visual acuity of her left eye. This was amblyopic, and by re-education its vision was improved to 6/6. The strength of the prisms was gradually reduced, and after six weeks' treatment she could maintain bimacular fixation for short periods without prisms. She has since worn her normal correction with only 3 Δ R and L, and has enjoyed binocular vision without any supplementary attachment to her glasses.

Mr. de Villiers's traumatic cases and non-traumatic cases of this type belong to a group of squints primarily of psychoneurotic origin. Another member of the same group, despite certain different aetiological factors, is undoubtedly the ordinary concomitant squint of childhood. Their treatment should be directed primarily to the cause, and operative interference with anatomically normal muscles avoided, excepting cases dependent on some focal lesion.

I must apologize for encroaching on so much of your valuable space, but my justification lies in Mr. de Villiers's comment that these cases have not received the attention they deserve in ophthalmic literature.—I am, etc.,

London, W.1, May 30th. W. H. SUMMERSKILL.

## Treatment of Varicose Diseases

SIR,—The use of reverse-rolled elastoplast was advocated by Dr. John T. Ingram in the *Journal* of June 1st, 1935 (p. 1126). I had excellent results by this method during the six months prior to this date, and I am sure Dr. Stuart McAusland must have overlooked this letter. Extra support can be given to the leg by applying a thin layer of cotton-wool on the sticky surface and finally putting on an ordinary bandage over this.—I am, etc.,

London, W.1, June 1st. MICHAEL J. FENTON.

## Dye Dermatitis

SIR,—I have received a pamphlet through the post entitled "Interim Report on Alleged Dye Dermatitis Position." It relates that a committee representing colour users and makers has met ten times and collected a large amount of information, and has decided to try and find a case which would enable them to obtain a Court of Appeal decision on idiosyncrasy not being included in the term "reasonably fit" of the Sales and Goods Act, 1893. It has been estimated this would cost £3,000, which it is proposed to spread over the dye-using and dye-making interests.

Three dermatologists, one in London, one in Leeds, and one in Manchester, have been "recommended" by the committee. It is also reported that "it has also been suggested that one firm of solicitors should be appointed to handle all cases, but this suggestion is strongly objected to in many quarters." The Alleged Dye Dermatitis Committee should, they say, be given authority and financial backing to fight any suitable case which is reported to it, and it should endeavour to get its point of view distributed to the profession by means of journals such as the *Lancet* and the *Analyst*.

It is a little difficult to appreciate this communication at its full value. I conceive it possible that dermatologists apparently committed in advance to a fixed outlook on "alleged dye dermatitis" would find difficulty in convincing a court of their entire freedom from bias in their approach to any case. My three colleagues will no doubt share my regret that the distribution of the £3,000 is not to fall with impartiality upon all practising dermatologists. I am sure they themselves are not party to the suggestion that their other colleagues are less wide awake to the problems of idiosyncrasy. I would not suggest their cognizance of this pamphlet.

It is well that skin specialists who are in a position to sign certificates of dye dermatitis should know what they may be up against. I have no doubt they will, as in the past, deal with each case on its merits, according to their knowledge and experience. It is stimulating to know that any one of us in practice may, without prevision, sign the test certificate on which will rest the case on which the Court of Appeal may hear our cross-examination on idiosyncrasy in all its bearings.—I am, etc.,

London, W.1, May 29th. W. J. O'DONOVAN.

## Birth Control

SIR,—In the lecture delivered by Professor James Young at Aberdeen, and reported in the *Journal* of May 30th (p. 1091), he refers to the fact that the Ministry of Health has empowered local authorities to make provision for contraceptive advice to be given to married women in cases where pregnancy would be detrimental to their health; and adds: "This State acceptance of the part that birth control is capable of playing in the sphere of public health is a powerful commentary on the strength which the movement has achieved for itself in modern times."

I think we should take it as a further proof of the growing interest in the subject of birth control when so eminent a gynaecologist as Professor Young finds it of interest to summarize the available information and expound it to the medical profession. With regard to the section of Professor Young's lecture devoted to birth control clinics and the more usual chemical and mechanical measures, may I draw attention to the fact that the results both of laboratory research and of clinic practice demonstrate the importance of a combination of both methods—that is, a vaginal barrier supplemented by a spermicide. This is the practice now advised in clinics in this country.

One further point. Professor Young refers to contraceptive suppositories and douches, saying: "So far as I know there has been no adequate study of their relative effectiveness." Surely the work of Dr. Baker, some of which was done for the Birth Control Investigation Committee, and published in his recent book *The Chemical Control of Contraception*, deserves mention in this connexion.—I am, etc.,

London, N.W.1, June 4th. CECILE BOOYSEN.

## Physical Education

SIR,—With reference to Appendix II to the report of the Committee on Physical Education, which appeared in your issue of April 18th, and which, I regret to say, came to my notice for the first time to-day, I would like to point out that P. H. Ling became director of the Royal Central Gymnastic Institute during 1813, not 1814, as stated. Also that Ehrenhoff was not the first person to introduce Swedish gymnastics into England: this was done by Govert Inde Betou, who settled in London during 1838. I would also like to have seen a reference to the fact that Mr. Allan Broman, G.D., of Sweden, was the person who taught our Navy Swedish physical drill during 1903, as I have seen other persons credited with this at varying later dates:—I am, etc.,

London, W.1, June 2nd. EDGAR CYRIAX, M.D.

## Urinary Complications of Prolonged Immobilization

SIR,—Dr. L. A. Key (*Journal*, June 6th, p. 1150) is to be commended for drawing our attention once more to the urinary tract complications which are apt to arise during the treatment of surgical tuberculosis and orthopaedic conditions by prolonged immobilization in recumbency. This is a matter on which we at Leasowe hold very strong views. We are always on the *qui vive* for calculus formation and other urinary complications, and have adopted active methods for their prevention as an integral part of our treatment of all diseases requiring long recumbency. What does it profit a patient to be cured of a tuberculous joint if his renal tract is left in a state of disorganization due to calculus?

Undoubtedly the chief factor in stone formation in this form of treatment is lengthy recumbency in the dorsal decubitus. For this reason, during the past two and a half years, it has been our custom to turn all cases of tuberculosis of the spine from the supine to the prone position periodically in an anterior plaster shell. The result has been a complete absence of urinary signs and symptoms in all cases. Thirty-six of these cases are still in hospital, and have had periods of recumbency varying from at least twelve months to three years. They all are suffering from lower thoracic or lumbar disease, and their kidney shadows are clearly visible in *x* rays; in not one case is there radiological evidence of stone. The only spinal case which we have been unable to "turn" is a boy suffering from a congenital deformity of the spine, with spastic paraplegia in flexion; he developed pain and haematuria months after immobilization in the dorsal decubitus.

As a control group I will quote our experience with the thirty-two cases of tuberculosis of the hip at present in hospital, whose period of recumbency has been from one to three years. Until recently it has not been our custom to "turn" these patients regularly to the prone position; two of them, before regular turning was instituted, developed frank renal calculi, and two others had attacks of haematuria without *x*-ray evidence of stone. If we regard the latter two as potential cases of calculus 12.5 per cent. of these hip cases which have been for very long periods in the dorsal decubitus without being turned have developed renal calculi. In our cases of glandular tuberculosis, which are never kept recumbent for more than a few weeks, no case of renal stone has been detected.

The evidence, then, seems to damn the lengthy recumbency in the supine position as being the all-important factor in this type of stone formation. For a long time we have known that stones (mud stones, as Dr. Key aptly describes them) which develop during recumbency often disappear later during ambulatory treatment—when all other factors of treatment, such as splinting, diet, and insolation, are unchanged. If, then, movement is the important factor in causing the disappearance of these stones, surely periodic movement of the patient (as distinct from the diseased part) during treatment may be expected to prevent their formation.

It is now our custom to turn periodically (once every fortnight is sufficient) all cases treated in recumbency, and we no longer have any fear of the development of renal calculus which hitherto has been a bugbear of the treatment of surgical tuberculosis. I would join with Dr. Key in expressing the very highest regard for Gordon Pugh and his work in this branch of surgical tuberculosis.—I am, etc.,

R. J. B. MCEWEN, M.B., Ch.M.,
Senior Resident Medical Officer, Liverpool Open-air Hospital for Children.

Leasowe, June 9th.

# Obituary

## A. E. COPE, M.D., D.P.H.

We regret to announce the death, on June 5th, of Dr. Albert Ernest Cope, who practised for forty years in Westminster and was an authority on the work of Poor Law medical officers and of public vaccinators. He was born at Chesterfield on October 29th, 1867, the son of the Rev. T. J. Cope. After school days at Mansfield and at Hull Grammar School, he entered the Hull and East Riding College in 1884, and continued his medical studies at Newcastle-on-Tyne, where he won a series of scholarships. He graduated M.B., B.S., with first-class honours, at the University of Durham in 1889, and obtained the M.B. of the University of London in 1890, proceeding to the M.D. of Durham three years later. In 1896 he obtained the D.P.H. of the English Conjoint Board. After a year as house-surgeon at the Royal Victoria Infirmary, Newcastle, he came to London as resident medical officer to the Westminster Dispensary, and then began general practice in Belgrave Road. He was for many years public vaccinator for the City of Westminster, district medical officer to the London County Council, and teacher and examiner under the Local Government Board and the Ministry of Health. He was also a prominent member of the Association of Poor Law Medical Officers, acting as its chairman for several years; honorary secretary and treasurer of the Association of Public Vaccinators; and honorary secretary of the Association of Local Government Medical Officers.

Dr. Cope joined the British Medical Association in 1891, was a Representative from 1917 to 1922, and on two occasions a member of the Insurance Acts Committee. He also served on the committee concerned with the inquiry into the administration of relief of casual poor in 1929. He published papers on vaccination in the *Journal of the Sanitary Institute* and in the *British Medical Journal*, and translated Kübler's *Geschichte der Pocken und der Impfung*. Apart from his long and valuable work in hygiene and public medical administration, Dr. Cope was widely known in Methodist circles in Westminster for his religious and social activities.

## HAMILTON C. MARR, C.B., M.D.

Late Senior Commissioner, General Board of Control, Scotland

The death took place suddenly on June 3rd at his residence in Succoth Avenue, Edinburgh, of Dr. Hamilton C. Marr, who had been senior commissioner on the General Board of Control in Scotland until his retirement last year.

Hamilton Clelland Marr was born at Govan, Lanarkshire, in 1870, and was educated at Glasgow High School and the University of Glasgow, where he graduated M.B., C.M. in 1892, taking the M.D. degree three years later. From the beginning of his medical activity he was specially interested in mental disorders, and he took up the post of assistant medical officer in the Crichton Royal Institution, Dumfries. In 1901 he was appointed medical superintendent of the Glasgow District Asylum at Woodilee, Lenzie, and in this post he remained until the year 1910. During this period he acted as MacIntosh Lecturer on Psychological Medicine in St. Mungo's College, Glasgow, and in 1910 he was appointed a Commissioner in Lunacy for Scotland. During the war, as a lieutenant-colonel in the R.A.M.C., he acted as specialist in nervous diseases for the troops at Malta in 1915-16, and on returning to this country he was consultant in neurology to the Scottish Command, 1916-19. His experiences in the war formed the basis of his work *Psychoses of the War, including Neurasthenia and Shell Shock*,

which attracted much attention upon its publication in 1919. Other publications from his pen were articles on "Hypochondria" and "Illegitimacy" in the *Encyclopaedia of Religion and Ethics*, 1913; "Feeble-minded and Backward Children" in Kelynack's *Defective Children*, 1913; and "Examination of the Cerebro-spinal Fluid in General Paralysis for Purposes of Diagnosis" in the *Review of Neurology and Psychiatry*, 1908.

Dr. Marr's work on the General Board of Control extended over a period of twenty-five years, and he retired from the post in October, 1935. His interest in mental disease and in the care of those suffering from mental disorders was very keen, and he was held in high respect and affection by the various officials of institutions for the treatment of these disorders with whom he came in contact. He held strongly to the opinion that at the root of mental changes there was always some physical change which might be discovered by the physician, or which the increase of medical knowledge in the future would elucidate. Towards the end of his term of office he was taking a special interest in the organization of outdoor clinics for the treatment of early cases of mental disorder, and this subject was still being pursued by him after his retirement and up to the time of his death. He joined the British Medical Association in 1895, and was vice-president of the Section of Mental Diseases at the Annual Meeting in Edinburgh in 1927. He was created C.B. in 1932.

Dr. Marr is survived by a widow, a son, and a daughter. The interment took place at the Dean Cemetery, Edinburgh, on June 6th, and was attended by a large number of friends and colleagues.

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We regret to record the death of Dr. JAMES JENKINS CAMPBELL of Grange Road, Newcastle-on-Tyne, in his seventy-sixth year. Born in Galloway, he received his medical education in the University of Glasgow, where he graduated M.B., C.M. in 1883. He proceeded M.D. five years later. His earlier appointments included those of resident surgeon, senior resident physician, and assistant aurist at the Royal Infirmary, Glasgow. He visited India as a ship's doctor, and then practised for a time at Barrow-in-Furness. More than forty years ago he went to Newcastle, and practised there until some six years ago, when ill-health caused his retirement. Dr. Campbell joined the British Medical Association in 1900, and was chairman of the Newcastle-on-Tyne Division in 1907. He leaves a widow, two daughters, and a son, who is in practice in Newcastle.

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The death occurred at Whitchurch, Glamorganshire, on June 2nd, after a short illness, of Dr. RHYS DAVID MORGAN, who was born at Aberdare in November, 1857. He was educated at the University of Glasgow, and qualified L.R.C.P.Ed., L.R.F.P.S.Glas., and L.M. in 1884. Afterwards he held the resident posts of house-surgeon and house-physician at Glasgow Royal Infirmary. He was house-surgeon to the late Sir William Macewen, and often alluded to his distinguished chief, who left a lasting impression on his work. Dr. Morgan was in practice at Ynysybwl for close on fifty years, and led a very busy professional life as surgeon to the Ocean Collieries. He was fortunate in being able to do most of the surgical work in his practice at a time when there was no hospital nearer than Cardiff. He was later one of the honorary surgeons to the Pontypridd Cottage Hospital, and was a justice of the peace for the County of Glamorgan. Dr. Morgan's tall stalwart figure was familiar in the colliery districts of South Wales for many years, and his direct and somewhat brusque manner was understood, for it concealed a genuine sympathy and a loyal spirit. He was a keen Volunteer in the old days, and was later in the Territorial Force for many years, holding the rank of major, and serving at home during the whole period of the great war. He had lived in retirement at Whitchurch for the past five years, and is survived by his wife and four daughters, one of whom is married to Dr. Trevor B. Davies of London.

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Dr. GEORGE BURTON ROBINSON, who died at the Priory, Cannington, near Bridgwater, on June 4th, was born in 1869, and received his medical education at Newcastle-on-Tyne and the London Hospital. He gained honours in anatomy, physiology, and materia medica at the intermediate M.B. examination of the University of Durham in 1889, and took the M.R.C.S. and L.R.C.P. diplomas in 1892, graduating M.B. in 1894. For a good many years he held a commission in the R.A.M.C.(T.), attaining the rank of major and receiving the Territorial Decoration. After the war he was appointed neurological specialist to the Ministry of Pensions, and visiting physician to the Ministry's hospital for officers at West Kirby. In former years he had contributed papers to the *Journal of Mental Science*, the *Lancet*, and the *British Medical Journal*. Dr. Robinson joined the British Medical Association in 1894, and after moving to the West of England became a member of the West Somerset Division.

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We regret to announce the death on May 31st of Dr. ALEXANDER BALLANTYNE at his home in Liverpool Road, Southport. He was born in Glasgow in 1882 and studied medicine at the University of Glasgow, graduating M.A., M.B., and Ch.B. in 1908. He first practised in Darwen, and later at Blackburn, moving to Southport in 1919. Dr. Ballantyne joined the British Medical Association immediately after the war and served as chairman of the Southport Division in 1926–7. He was also treasurer of the Southport Medical Society and medical officer to the local football club. He leaves one son.

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Dr. AGNES LIVINGSTONE-LEARMONTH died on May 30th at Yenching University, Peking, aged 59. She was the wife of Dr. Basil L. Livingstone-Learmonth, and the eldest daughter of the late Rev. John Sinclair Hamilton of Dublin. After studying medicine at the University of Edinburgh she graduated M.B., Ch.B. in 1901. From 1914 to 1919 she served with medical units in the war, and was mentioned in dispatches and created C.B.E. (Mil.) in 1919. Her marriage took place in 1902.

## Universities and Colleges

### UNIVERSITY OF OXFORD

At the Encaenia on June 24th the degree of D.Sc. will be conferred on Dr. Edgar Douglas Adrian, F.R.S., of Cambridge, Foulerton Professor of the Royal Society.

At a congregation held on June 6th the degree of D.M. was conferred on J. N. O'Reilly.

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### UNIVERSITY OF LONDON

At a meeting of the Senate held on May 20th it was resolved to institute a University Readership in Physics, tenable at the Royal Cancer Hospital (Free) in accordance with the Regulations on University Titles.

*Regulations for M.S. Degree, Branch I*

The Regulations for the M.S. Degree, Branch I (*Red Book*, 1935–6, p. 290; *Blue Book*, September, 1935, p. 274) were amended by the deletion under the heading "Details of Examination" of "Operations on the Dead Body."

*Appointments*

Professor G. E. Gask, F.R.C.S., and Dr. A. M. H. Gray were appointed governors of the British Post-Graduate Medical School.

*Lectures*

A course of lectures on applied helminthology, with special reference to the control of agricultural and horticultural pests and the internal parasites of farm animals, poultry, and game-birds, has been arranged by the University Extension and

Tutorial Classes Council in co-operation with the Institute of Agricultural Parasitology of the London School of Hygiene and Tropical Medicine. The course is intended for graduates and diplomates in agriculture, horticulture, and veterinary sciences, members of staffs of agricultural colleges, officers or intending officers of Colonial agricultural and veterinary services, and officers engaged under local authorities, and will be held from July 13th to 31st. Lectures and laboratory work will be at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., and field demonstrations at the Field Station of the Institute of Agricultural Parasitology, Winches Farm, Hatfield Road, St. Albans. Certificates of attendance will be granted to those who have attended regularly. Full particulars may be obtained from the secretary of the London School of Hygiene and Tropical Medicine.

The following candidates have been approved at the examination indicated:

THIRD M.B., B.S.— *†‡‖J. C. B. Bone (University Medal), *§E. P. Clarke, *†C. J. Cobbe, *†A. L. Craddock, *§R. S. Ellis-Brown, *‖Joyce M. George, *‡S. Glaser, *†C. A. Lillicrap, *§Mary H. Robbins, *‖Eileen D. M. Wilson, Ruth M. Addison, C. Anderson, G. A. Armstrong, H. R. Arthur, R. A. J. Asher, Mary Barber, H. H. F. Barns, H. L. W. Beach, B. E. Blair, Kathleen E. Burnell, H. Caplin, H. B. C. Carter-Locke, Annys M. Cusack, T. Denness, E. W. Dunkley, A. G. Edwards, G. J. Evans, H. D. Fairman, J. E. Giesen, R. M. Glass, J. Glazer, Margaret M. Hanford, H. R. S. Harley, J. Hartsilver, C. E. W. Hoar, C. D. Holdstock, K. F. Hulbert, A. C. Jones, W. W. Jones, A. C. Kanaar, G. H. W. Keates, L. M. Kelly, H. M. Kelsey, F. B. Kiernander, F. J. D. Knights, J. H. Lawrence, W. D. F. Lytle, J. McA. McArthur, J. R. M. Martin, Elizabeth M. Morgan, E. G. Murphy, Lucy M. B. Nelson, R. J. Niven, K. L. G. Nobbs, H. A. Oatley, J. D. Ogilvie, W. A. Oliver, J. Pemberton, Marjorie L. Penwill, Dorothy J. Perkins, Lena F. G. Priestman, Grace E. Reed, J. C. Roberts, Irene H. Rogers, E. Sayle, Mary Scott, D. J. Sheehan, W. E. Springford, W. J. Stokes, C. H. Tanner, R. N. Tattersall, F. Taylor, G. R. Taylor, H. C. Thomas, R. C. Tudway, Winifred J. Wadge, A. Wardale, H. F. West, D. Wilson, C. A. Young. *Group I:* Helen M. Alcock, Minnie Atkin, Priscilla B. Clark, M. L. Corera, Hilla Damry, J. D. O. Fearnley, Margaret A. B. Fleming, D. F. Freebody, G. A. Hart, B. W. Hunt, M. Lederman, V. N. Leyshon, Alison J. McNairn, M. Markowe, Nora M. Pettitt, Gwen Richards, J. W. R. Sarkies, Katharine D. Smith, Christine M. Stacey, H. J. Stammers, H. W. Thomas, R. G. Tuke, J. R. Wilson, G. N. Wright, P. J. M. Wright. *Group II:* S. Balasingam, E. J. W. Barnard, G. C. Brentnall, K. P. Brown, J. W. C. Cochrane, J. C. Colbeck, R. S. Dale, C. W. Dixon, R. B. Evans, R. E. Gibson, T. N. Grundy, T. E. Howell, T. P. N. Jenkins, J. D. Kinnear, L. R. Leask, O. Lloyd, J. P. McGladdery, Alice L. Musgrave, J. H. L. Newnham, Ananda Nimalasuria, Faith C. Poles, J. Ll. D. Roberts, K. G. Rotter, D. M. Samuel.

* With honours. † Distinguished in Medicine. ‡ Distinguished in Pathology. § Distinguished in Surgery. ‖ Distinguished in Obstetrics and Gynaecology.

### UNIVERSITY OF DURHAM

Professor T. H. Pear, who holds the chair of psychology in the University of Manchester, has been appointed Riddell Memorial Lecturer for 1936–7.

### ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow held on June 1st, with the President, Professor Archibald Young, in the chair, the following were admitted Fellows: William Beattie, John Fleming, William Ian Gordon, Ronald Guthrie Lendrum, James Wallace Macfarlane, Joseph Charles Pinch, David Ross, Archibald McLellan Wright Thomson.

## The Services

### HONORARY SURGEON TO THE VICEROY

Colonel W. J. Powell, C.I.E., I.M.S., has been appointed Honorary Surgeon to the Viceroy and Governor-General of India, vice Colonel I. M. Macrae, C.I.E., O.B.E., I.M.S., vacated.

### DEATHS IN THE SERVICES

Lieut.-Colonel William Campbell, late Grenadier Guards, died at Walton-on-the-Hill, Tadworth, Surrey, on May 24th, aged 85. He was born in Edinburgh on November 1st, 1850, and was educated in the university in that city, where he graduated M.B. and C.M. in 1872. He entered the Army as surgeon on September 30th, 1874, was appointed surgeon of the Scots Guards on January 12th, 1881, and transferred to the Grenadier Guards as surgeon-major on November 3rd, 1887, becoming surgeon lieutenant-colonel on September 30th, 1894, and retiring on June 26th, 1897. He served in the Egyptian War in 1882, was present at the action of Tel-el-Kebir, and received the Egyptian medal, with a clasp, and the Khedive's bronze star.

Lieut.-Colonel Charles Reade Monroe Morris, D.S.O., R.A.M.C. (ret.), died at Cullompton, Devon, on June 2nd. He was born on November 10th, 1882, and was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., and B.A.O. in 1905. Entering the R.A.M.C. as lieutenant on January 30th, 1906, he reached the rank of lieutenant-colonel in 1925, and retired, owing to ill-health, on July 1st, 1931. He served in the war of 1914–18, was mentioned in dispatches in the *London Gazette* of January 4th and May 29th, 1917, and received the D.S.O.

## Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

### Duty on Hypodermic Needles

The House of Commons resumed on June 9th after the Whitsuntide Recess, and discussed the Finance Bill in committee. On Clause 5 (which continues Part I of the Safeguarding of Industries Act, 1921, for a further period of ten years from August 19th, 1936) Mr. THURTLE moved an amendment that the subsection which provides for the importation of certain scientific apparatus free of duty provided that the Board of Trade is satisfied that such goods are not likely to be made in this country within a reasonable time or in sufficient quantities. The amendment provided that the Board of Trade must also be satisfied that such goods are not likely to be available in this country "at a reasonable price." Mr. G. GRIFFIFTHS, who seconded the amendment, said that hardship was caused to diabetic patients by the 33⅓ per cent. duty on hypodermic needles.

Dr. BURGIN, in reply, said that the section did not apply to hypodermic needles, but was to enable high-priced scientific instruments to be brought into the country free of duty. In the case of such instruments, which would probably be ordered singly, he questioned whether it was possible to define "a reasonable price."

Sir FRANCIS ACLAND said that until a few months ago a first-rate British hypodermic needle made of rustless steel could not be obtained, and if the needle were not rustless the expense of obtaining fresh needles was considerable. There were now two sorts of British needle. We had beaten the foreign needle on merits, and he could not believe that the British manufacturers, having succeeded in making first-class goods, would wish to rely on a high duty.

The amendment was negatived by 192 votes to 131.

### Accidents to Boys in Mines

CAPTAIN CROOKSHANK informed Mr. Robert Taylor, on June 9th, that in 1933 146 boys of 14 years of age were injured (disabled for more than three days) in Northumberland mines, while one boy of 15 was killed and 206 were injured. In 1934 one boy of 14 was killed and 264 were injured, and 249 boys of 15 were injured. In 1935 227 boys of 14 were injured, three boys of 15 killed, and 312 injured. In Durham mines in 1933 two boys of 14 and three boys of 15 were killed; 356 boys of 14 and 614 of 15 were injured. In 1934 two boys of 14 and one of 15 were killed, and 530 of 14 and 760 of 15 injured. In 1935 one boy of 14 and seven of 15 were killed, and 479 of 14 and 1,008 of 15 injured.

### Health Insurance Benefit Statistics

Sir KINGSLEY WOOD, replying to a question on June 9th, said it was estimated that at the end of 1935 there were in Great Britain 17,708,000 insured persons entitled to medical benefit. During 1935 £1,756,000 was expended in the provision of dental benefit by approved societies, with a total membership of 11,112,000; £414,000 was expended on ophthalmic benefit by approved societies, with a total membership of 10,645,000; and £110,000 was expended on convalescent home treatment benefit by approved societies, with a total membership of 10,829,000.

# Medical News

The eleventh Fison Memorial Lecture will be delivered by Professor Charles Singer on "Magic and Medicine in Early England," at Guy's Hospital, S.E., on Thursday, June 18th, at 5 p.m., with Mr. H. L. Eason in the chair.

The Minister of Health, Sir Kingsley Wood, will address the annual meeting of the British Social Hygiene Council at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., on Wednesday, June 17th, at 2.45 p.m. Mr. L. S. Amery will be in the chair, and all interested are invited to attend.

An extra meeting of the Section of Pathology of the Royal Society of Medicine will be held at 1, Wimpole Street, W., on Tuesday, June 23rd, at 8.30 p.m., when Dr. Joseph Needham will deliver a lecture on "Chemical Aspects of Normal and Pathological Growth." A provincial meeting of the Section of Disease in Children of the Society will be held at Addenbrooke's Hospital, Cambridge, on Saturday, June 27th, at 2.30 p.m.

The annual meeting of the Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-minded will be held in the "Wyatt" House Home of the Mary Dendy Homes, Sandlebridge, on Friday, June 19th, at 2.30 p.m., under the presidency of the Lord Mayor of Manchester, supported by the Mayor of the Manor of Ashton-under-Lyne, Dr. C. C. Heywood, and members of the governing body. The day school, homes, and workshops, Ashby Memorial Hospital, and the farm and gardens will be open for inspection after the meeting.

The Harveian Society of London will hold its annual summer meeting on Saturday, July 18th, when the members will be the guests of the Port of London Authority, who have arranged for a cruise down the Thames on their steam yacht *St. Katherine*, starting from Tower Pier at 9.45 a.m.

The annual meeting of the International Campaign Against Charlatanism will be held in Brussels on June 21st, at the University, at 2.30 p.m., during the course of the Journées Médicales. Professor David of Lille will discuss the extent of quackery in neighbouring countries, and special attention will also be devoted to the questions of midwives and trade names. Further information may be obtained on application to the secretary of the society, Dr. Gildemyn, 232, Longue Rue d'Argile, Antwerp.

The Fellowship of Medicine (1, Wimpole Street, W.) announces the following courses: general surgery at Prince of Wales's General Hospital, June 27th and 28th; children's diseases at Princess Elizabeth of York Hospital, July 4th and 5th; heart and lung diseases at Victoria Park Hospital, July 11th and 12th; proctology at St. Mark's Hospital, July 6th to 11th; dermatology at Blackfriars Skin Hospital, July 13th to 25th; and urology at All Saints' Hospital, July 13th to August 1st.

Sir Robert Philip will preside over the twenty-second annual conference of the National Association for the Prevention of Tuberculosis, which, as previously announced in these columns, is to be held at the County Hall, London, on July 16th to 18th. Tuberculosis experts have been invited to give addresses on the examination of contacts; the protection of the adolescent and the young adult; the present position and policy as regards tubercle-free herds; and the need for closer co-operation between the tuberculosis service and the maternity and child welfare service, and possibly the education authorities. Delegates from all over the world are expected to be present.

The German Society for Diseases of Digestion and Metabolism will hold its annual meeting in Berlin in combination with the International Union of the Medicine of Sport on July 27th and 28th. Further information can be obtained from the president, Professor M. Bürger, Medizinische Universitäts-Poliklinik, Bonn.

The third International Congress of Oto-laryngology will be held in Berlin from August 17th to 22nd, at the same time as the Olympic Games. Further information can be obtained from Professor Klaus Vogel, Luisenstrasse 11, Berlin, N.W.7.

The eleventh International Congress of Psychology will be held at Madrid from September 6th to 12th under the patronage of the Spanish Government and the presidency of Professor E. Mira of Barcelona. The official languages will be Spanish, English, French, German, and Italian. Further information can be obtained from the general secretary, Dr. José Germain, Instituto National de Psicotecnica, Alberto Aguilera 25, Madrid.

The French Society of Dermatology and Syphilography will shortly celebrate the eightieth anniversary of its doyen, Dr. Darier, by the presentation to him of a special edition of his communication to the recent congress at Budapest on the history of dermatology in the last fifty years. Those desiring a copy should send their names and addresses with a cheque for 30 francs to M. Georges Masson, 120, Boulevard Saint-Germain, Paris.

The third International Light Congress will be held at Wiesbaden between September 1st and 7th under the presidency of Professor Friedrich of Berlin. Further information can be obtained from the secretary-general of the congress, Dr. H. Schreiber, Robert-Koch Platz 1, Berlin, N.W.7.

The French medical journal, *Concours Médical*, is organizing an excursion to Canada and the U.S.A. to start from Cherbourg on August 18th, and to return to Havre on September 16th. Cost, tourist class, 7,425 francs. The same journal is organizing an excursion in the Arctic regions, to last from August 1st to 25th, and to cost 3,275 francs.

The Ex-Services Welfare Society, 51, Victoria Street, S.W.1, is convening a conference of its psychological specialists and other psychiatrists from all parts of the British Isles to discuss "Some of the Sequels of War Stress." The conference will be held at the Hyde Park Hotel, London, on July 3rd. Dr. Edward Mapother, the society's chief consultant, will be in the chair.

The Fédération Internationale des Sociétés d'Eugénique will meet on July 16th to 21st in Holland at Scheveningen and at The Hague. Further information can be obtained about the French contributions to this meeting from Dr. Georges Schreiber, 26, Avenue du Recteur-Poincaré, Paris.

It is proposed to hold the Annual Conference for Medical Officers in Industry Overseas on Thursday, July 16th, at the London School of Hygiene and Tropical Medicine, in order that medical officers in industry on leave from the Tropics may be able to meet their colleagues and discuss their problems. The main subject for discussion will be the prevention of disease—for example, the control of malaria and epidemic diseases in the Tropics—water supplies, sewage and refuse disposal, housing, the keeping of records, and hygiene generally. Medical officers practising on plantations, mines, railways, hydro-electric and construction schemes, and development companies generally are invited to attend. Government health officers will also be welcome. Applications should be made as early as possible to the organizing secretary, Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, Keppel Street (Gower Street), London, W.C.1.

An association of doctors and pharmacists who are men of letters has recently been founded in Paris, with Professor Roger as president and Dr. Georges Duhamel as vice-president. Further information can be obtained from the general secretary, Dr. P. E. A. La Bessède, 1A, Plâce de l'Université, Strasbourg.

The Secretary of State for Scotland has appointed Dr. James McLauchlan Johnston to be a Deputy Commissioner of the General Board of Control for Scotland. Dr. Johnston graduated M.B., Ch.B. in Edinburgh in 1926. He has since held several public appointments, and for the last three years has been on the medical staff of the Rampton State Institution for Mental Defectives.

# Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

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## QUERIES AND ANSWERS

### Dipsomania

"J. D." writes: I have read with interest the communication of "Retired Practitioner" in reference to the above (*Journal*, February 8th, p. 294). Would he kindly state how much vin. ipecac. he allows in the twenty-four hours?

### Trousseau's Aphorism

Dr. S. L. B. WILKS (Colwyn Bay) writes: "Il n'y a pas de maladies: il n'y a que des malades." I am under the impression that I have seen these words, or something like them, quoted on the title-page of a book, and ascribed to Trousseau. Can anyone tell me whether I am right, and give me a reference?

⁂ The aphorism is one of Trousseau's, but we have not so far been able to trace it to its exact source.

### Income Tax

*Allowance for Use of Motor Car*

"F. V." bought a car for £250 about eighteen months ago, and up to the present year has claimed to deduct two-thirds of the cost of running it, including tax and insurance. He never uses the car for holidays, and only "a very little for ordinary non-professional driving." He has claimed the whole of the cost for 1936–7, and that has been refused.

⁂ It does not follow because a car is "necessary" that the *whole* cost is allowable, but on the facts stated two-thirds seems an insufficient proportion for professional use; one would suggest, say, 80 to 85 per cent. "F. V." can claim depreciation allowance at 22 per cent. for 1935–6—say 22 per cent. of £250 = £55—but as the two-thirds basis was adopted for that year the actual allowance will be £37. For 1936–7 the allowance will be, say, 85 per cent. of (22 per cent. of £200 =) £44—that is, £37.

*Employment Abroad*

"INQUIRER" lives abroad, and has no residence in the United Kingdom. He proposes to come either to this country or to the Irish Free State for a year's study and clinical work. What will be his position as regards income from foreign investments not remitted to him and British War Loan interest? Will it be affected if he takes a hospital appointment?

⁂ Assuming that he can show that he has no intention of taking up a permanent residence in the United Kingdom, he will be regarded during his stay as "resident" but not "ordinarily resident." On that basis he will be liable to account for tax on the amount (less the personal allowance, etc.) of (*a*) his earnings and (*b*) the *remitted* income from abroad. He will not be liable on unremitted income or on the War Loan interest. The same applies to the Irish Free State, except that the exemption of British War Loan interest would not apply.

## LETTERS, NOTES, ETC.

### Oedema Neonatorum

Dr. EWING RODGERS (London, S.E.5) writes the following account of a case he saw recently: The baby, a female, was delivered normally (it being the mother's second child, the first a normal one in every way) and was well, ostensibly, until the fourth day, when the nurse noticed the thighs becoming swollen and hard; the oedema gradually spread up the body. We saw her early the next morning, when the general appearance of the infant at first sight suggested a case of tetany. However, the "tetanic" posture of the infant was found to be due to "splinting" of the limbs and body by widespread oedema. The fontanelle was tense, and crepitations could be heard at both bases. The oedema of the face was very noticeable. The infant had had three blood-stained vomits, and the stools had gradually changed from green to black. The child was taken off milk, but the vomit and stools contained increasing quantities of blood. A consultant diagnosed the condition and advised injections of the mother's whole blood; 3 c.cm. were duly given. The infant was fed on the drawn-off milk, as it was too weak to suck, and was kept warm artificially. The symptoms gradually abated without any further injections of blood, and on the seventh day the oedema was much less, the crepitations had disappeared, and the stools were green again; vomiting was infrequent. By the tenth day the symptoms had practically disappeared, although there was still a good deal of weakness. On the fourteenth day there was no discernible oedema, and the baby was feeding normally. It was seen regularly until the sixth week, and has been quite normal since then to the best of my knowledge. It might be interesting to know if similar cases have occurred in other practices, as it seems difficult to trace more than a few cases in the literature on the subject. The case seems to be especially interesting in that the baby when last seen was in excellent health, whereas the cases in the literature do not seem to have had a high percentage of survivals, if, indeed, survivals have been described.

### Gas and Public Authorities

People are so apt to take the work of the gas industry for granted that *Gas and Public Authorities*, a recent publication of the British Commercial Gas Association (28, Grosvenor Gardens, S.W.1) comes as a useful reminder of the way in which almost every branch of public administration has contacts with the gas industry. Housing and slum clearance, public lighting, central heating and cooking in public buildings, the equipment of hospitals and clinics, educational establishments, swimming baths, and other premises devoted to recreation, crematoria, municipal airports—all these are dealt with pictorially in the booklet. Among the installations illustrated are the House of Commons (large-scale cooking), Belfast City Hall (central heating), St. Bartholomew's Hospital, Central London's street lighting system, Southampton municipal crematorium, and the kitchen of the Royal Free Hospital.

### A Disclaimer

Dr. DONALD BLATCHLEY (Chiswick) writes: I feel that steps should be taken by those responsible to prevent articles or portions of articles appearing in the medical press from being used by the lay press, and reprinted by them in a sensational manner for the doubtful benefit of the general public. Recently you were good enough to publish a letter from me in which I expressed the opinion that individuals of a certain type reacted badly to a certain type of anaesthetic. This was instantly seized upon, and without my knowledge or permission extracts appeared in the lay press under sensational headlines (cuttings enclosed). The effect of this on the lay mind will undoubtedly be to increase the fear of anaesthetics, especially in those who are already of nervous temperament. This is distinctly contrary to one of the chief aims of modern technique—namely, to decrease pre-operative fear. I think you will agree that the effect is bad, both from the patient's and from the doctor's point of view.

### Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, and 60 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 58 and 59.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 328.